CARNATIONS & PINKS

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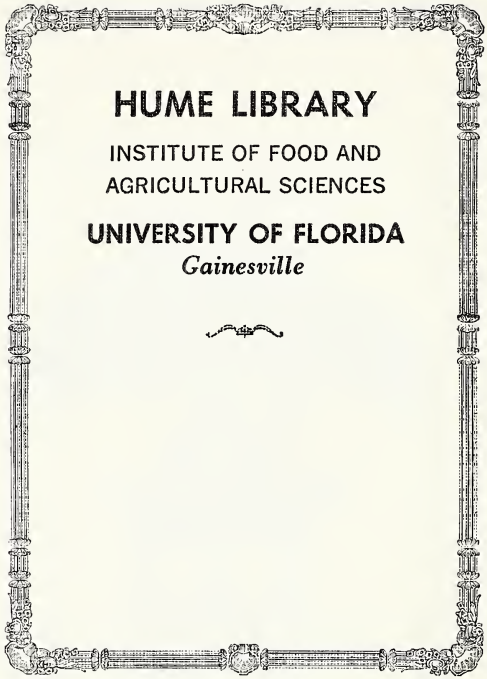

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GARDEN FLOWERS IN COLOR

EDITED BY . . . . .
R. HOOPER PEARSON
MANAGING EDITOR
OF THE *GARDENERS' CHRONICLE* . . . . .

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PLATE I (*Frontispiece*)

BORDER CARNATION

"RENOWN"

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Carnations & Pinks

By J. H. Cook
James Douglas & J. F. McLeod

With Eight Coloured Plates

NEW YORK
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PREFACE

WHATEVER else may be in doubt in regard to the history of the cultivated Carnation, we at least know that it was first loved in this country as a border flower. For four centuries the border varieties have been cultivated with increasing enthusiasm and in greater numbers. As compared with such a history, the Perpetual-Flowering and Souvenir de la Malmaison types may be regarded almost as newcomers. At the same time, these more recent acquisitions have increased the popularity of the flower throughout the length and breadth of the land. They may not be superior to the Old Clove Carnation or the Picotees, but they have characteristics that perfectly separate them from the older strains, and their cultivation is under glass rather than out-of-doors. When it is added that the perpetual-flowering sorts provide one of the brightest floral effects in the winter season, it is easily understood that, in present-day gardening, the Carnation appeals to a greater number of people than at any time in its history.

As a recognition of the distinctness of the Carnation groups, I besought the co-operation of the present authors in the writing of this volume. They need no introduction. The name of Mr. Douglas is as inseparable from Carnations as Dean Hole's from Roses. He has raised them, cultivated them, exhibited them, and written about them.

On the present occasion he writes as a veteran florist, with all the authority that comes of half a century's practical experience, and he treats upon a section he has always made peculiarly his own. Mr. McLeod has cultivated the Souvenir de la Malmaison varieties equal to the best in this country. Indeed, he was one of the first to succeed in producing such fine specimens as the plant of "Princess of Wales," illustrated in one of the plates. Mr. Cook, who writes of the Perpetual-Flowering varieties, has cultivated a collection in the Royal Gardens, Sandringham, formerly for King Edward VII. and latterly for Queen Alexandra, that has made the Royal Gardens famous for its displays of Carnations at every season of the year, including the comparatively sunless months of winter.

The reader may notice a little overlapping here and there. It is hoped that this will not be found a source of irritation but, on the contrary, a means of assisting him to thoroughly understand the practices of each author in the treatment of his special favourites. For the specimens illustrated in the plates, thanks are accorded to Mr. Douglas, Mr. McLeod, Mr. Cook, Mr. R. F. Felton, and Mr. J. G. Weston.

THE EDITOR.

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CARNATIONS AND PINKS

CHAPTER I

HISTORICAL NOTES

By JAMES DOUGLAS, V.M.H.

THE Carnations at present in cultivation in British gardens have arisen from the wild species of Dianthus known as *Dianthus Caryophyllus*. This species is not believed to be indigenous to Great Britain, but it has been naturalised here for many centuries. It is not known when the plant was introduced to these shores; some think that it may have been introduced by the Romans, but it is much more likely that its introduction occurred at a later date, and that it came here from Normandy. In any case, *Dianthus Caryophyllus* is the parent of all the brilliant, self-coloured Carnations, the varied and richly tinted fancies, the beautiful yellow and white ground Picotees, and the Flakes and Bizarres that were loved so much by the florists of the nineteenth century. When or where the first development into the semi-double or double form occurred, there is no information. We know from Turner's *Herbal*, published in 1550, that the Carnation had taken its place as a garden flower previous to that date, for Turner states that the flowers "are made pleasant and sweet by the wits of man and not by Nature." This is but a half-truth, for Nature had certainly

something to do with it. The wits of men had directed the natural capacity for variation into the right channels, and, in a measure only, made it responsive to their desires.

Chaucer died just 150 years before the publication of Turner's *Herbal*, and the "Cloue Gelofre" alluded to by him may have been the Carnation, although some believe it to be the clove tree. As affording some evidence of the popularity of the flower in the fifteenth century, it may be mentioned that King Edward IV. was a young man in 1463 and in a painting of this monarch he was depicted with a Carnation bloom in his hand. I have a note of this picture being sold at Christie's from the Bernal collection in 1855. Lot 936 in that sale is described as "an undoubted and rare portrait of Edward IV. in a gold dress, and crimson cloak edged with fur, a chain of jewels round his neck; he wears a black cap, and holds a red Carnation in his hand" (it was stated to be a Rose in error). The picture was bought by the Duke of Newcastle for 150 guineas. There is an excellent engraving of the picture as a frontispiece to the catalogue.

The Carnation must have been a favourite flower in the reign of Queen Elizabeth. Gerard's *Herbal* was published in 1597, and the Carnation was widely distributed at that time. Shakespeare was contemporary with Gerard. The *Winter's Tale* was published in 1623, and in the well-known conversation between Polixenes and Perdita, we obtain more knowledge of the Carnation than in any previous Herbal. The time of flowering: "The year growing ancient. Not yet on summer's death, nor on the birth of trembling winter." "The fairest flowers of the season are our Carnations, and streaked Gillyvors."

Parkinson in 1629 writes about the Carnation as being one of the greatest of garden favourites; the varieties being so numerous "that descriptions to them all were endless."

All through the seventeenth, eighteenth, and nineteenth centuries, the Carnation in its delightful and varied forms was the theme of all the writers on gardens and gardening; it was the favourite flower of the amateur and gardener. In the seventeenth and eighteenth centuries the Carnation was grown as a hardy garden flower, and the numerous varieties alluded to by Parkinson, owing doubtless to careless cultivation or improper management, had ceased to exist when Rea's *Flora or Complete Florilege* appeared in 1665. By 1676, when the second edition was published, hundreds of varieties had been imported from "Holland, Flanders and other parts of the Netherlands." John Rea certainly gave the subject of the "July flowers" very careful attention. He says: "As the Tulip is the glory of the spring, so is the July flower the pride of summer." It may be interesting to Carnation growers if a record is given of Rea's experience in London. The Carnations brought from Holland in immense numbers were sold "at mean rates to gardeners, who sell them again to others that delight in flowers, commonly at twelve pence a layer; but the truth is, most of these mercenary fellows about London are very deceitful, and whoever trusts them is sure to be deceived, as I myself have often been, even by such of them as I had by many benefits obliged."

Rea obtained but poor success in the raising of seedlings, although he saved his seeds from very good flowers. In his *Flora* he states: "I prepared the earth wherein I intended to sow them, with several composts, and, during

the winter, often watered it with brine, and at the spring when I sowed them, they had been steeped for twelve hours in dissolved nitre, and mixed them with calcined tartar, yet the effect did not at all answer my expectation." Full directions for culture were given, even to tying the calices of those that burst. He adds that he obtained but poor success, and did not advise the raising of Carnations by seed in England. He names 360 varieties, and nearly all of these had been imported. Some idea is given of the colours prevalent amongst these 360 varieties. "The more ordinary sorts are all of one colour, red, purple, scarlet or white, but the single colours are little esteemed. Those flowers are chiefly valued which are well flaked, striped, or powdered upon white or blush, with darker or lighter red, crimson, or Carnation, sadder or brighter purple, deeper or paler scarlet." "The second impression corrected with many additions" (1676) gives a very good idea of the varieties of Carnations cultivated in England 233 years ago.

During the next hundred years not much was done in England towards improving the Carnation. There is some description of Carnations in Hill's *Eden* (1757), in Hanbury's work (1770), and others published at about that time, but not much advance was made except in respect to the Bizarres and Flakes.

When Curtis established the *Botanical Magazine* in 1787 he intended to illustrate botanical objects and garden flowers of original species; but a few exceptions were made, and in the second volume an illustration was given of a scarlet Bizarre Carnation named Tartar, raised by an amateur cultivator residing in Lambeth. It is certainly a very good variety, well marked on a good white ground, and equal in merit to Admiral Curzon, which has been

the standard of excellence in this class for sixty years. Seventy years before Curtis started the *Botanical Magazine*, Broadley named and described the several sections of Carnations; the present long-calyxed type was introduced from France about 1740. The Clove Carnation was considered a variety by itself, as is the case to-day, "sweetly clove scented, and of a deep red or crimson colour." There has generally been a white Clove, but it is of some interest to know that the plants have always exhibited a weak constitution.

I have raised one variety named Bookham White Clove, which is very rich in the peculiar Clove perfume, but it will not last many years if exposed to the vicissitudes of our climate in the open border. On the contrary, white Carnations with but little scent are quite hardy and thrive well from year to year out-of-doors. One of the best is Trojan; certainly not inferior in hardiness of constitution to any border Carnation.

Flakes and Bizarres formed another class. Picotees had also come into existence under the name of Piquettes, or as in the modern name of Picotees; but at that time, and for half a century later, they appear to have comprised varieties which would be placed in the category of border or "fancy" Carnations. Painted or Dainty Ladies were much esteemed in those days. They are not much sought after now, but nevertheless they make a very bright feature in any collection of Carnations. The petals of these Dainty Ladies are rose or scarlet on the upper side, and whitish or of a pale rose or red colour on the under side.

Soon after the commencement of the nineteenth century, Carnations were shown at the public exhibitions, although in the earlier years the Peninsular wars, and the almost con-

stant fighting to resist the ambitious schemes of Napoleon, which culminated in his total defeat at Waterloo, were serious hindrances to the peaceful arts. A long period of peace ensued, and every description of gardening made rapid strides ; Carnations, Tulips, Auriculas, Pinks, Ranunculi, and other favourite florist's flowers were improved year by year. Those engaged in their cultivation held frequent meetings, standards of excellence were set up, and, so far as Carnations are concerned, the standard has not since been altered materially, as may be seen in the latest publication[1] by the Royal Horticultural Society.

But these early cultivators, in their eagerness to obtain large, richly coloured flowers, used highly stimulating manures, and they overfed the plants to such an extent that the varieties remained vigorous only for a very few years. There were so many amateur raisers and cultivators that a rapid succession of seedling varieties speedily replaced those that fell out of cultivation.

A very enthusiastic amateur named Thomas Hogg, a schoolmaster of Paddington Green, who cultivated the Carnation successfully in the early years of the nineteenth century, wrote a book on the flower which passed through several editions. He recommended less stimulating composts to prevent the "running" of the flowers, as it is termed, of the Flakes and Bizarres ; but even his less rich compost contained as much manure as loam ; and not content with this, the plants were to be surface-dressed with a compost "in which the chief ingredients are sugar-baker's scum, soap-boiler's waste, night soil, the dung of pigeons and poultry in general, blood, soot, lime, gypsum, etc., etc." After this list, one wonders what might be included in

[1] *Code of Rules for Judges.*

the "etc., etc." The growers acted according to the knowledge they possessed, but as they gained further experience, these stimulating manures were gradually discarded, a better system of culture was adopted, and, year after year, new varieties of better quality were added to the lists.

After the middle of the nineteenth century, a larger number of amateur cultivators, stimulated by the exhibitions of Carnations and Picotees, commenced to raise seedlings. These cultivators included Norman of Woolwich, E. S. Dodwell of Derby, the Rev. Charles Fellows, Ben Simonite of Sheffield, Lord of Todmorden, and Thomas Bower of Bradford ; but it is important to observe that not one of these attempted to do more than raise Flakes, Bizarres, or white-ground Picotees. The raisers frequently obtained exceedingly good self-coloured flowers amongst their seedlings ; but in most instances they were thrown away like undersized fish in the fishermen's nets.

The practice of exhibiting the flowers on cards had already become general. They were carefully dressed ; all the petals were spread out on the cards with the aid of tweezers ; but the art of dressing was not to be learned by every one. The greatest adepts at it began by first understanding the best flowers to select, next the proper arrangement of colours, especially in the case of the Flakes and Bizarres ; so strict were the judges, that if a single petal in a Bizarre did not contain the two colours well defined, it was a disqualification.

Hogg, in his book on the Carnation, which was first published in 1820, gives elaborate instructions for dressing, and adds that one "Christopher Nunn, of Enfield, Middlesex, a noted florist in his day, was eminent for his skill and dexterity in dressing Pinks and Carnations for prize

exhibitions. Some will even tell you, that Kit was the father of the Art. Upon such occasions, he had as many applications to dress flowers, as he had to dress wigs, for he was a barber and friseur by trade. The novices of that day, who, being unacquainted with the secret art, trusted to Nature to open, expand, and perfect their flowers, were no match for Nunn, for he began where Nature left off, and perfected what she had left imperfect. His arrangement and disposition of the petals were admirable, and astonished the novices." Kit's art of dressing is still an enviable art, and attainable only by a few. Hogg gives the names of 390 Flakes and Bizarres and 113 white-ground Picotees, but not one of them is now in existence. We are informed by the same author that the yellow Picotee was cultivated in England in the Royal Gardens, Frogmore, "obtained principally from Germany, and were the delight of all who saw them." The Empress Josephine in the early years of the century had "an admirable collection of yellow Picotees, at Malmaison." Her gardens were at that time under the superintendence of the botanist Bonpland. Fortunately Hogg gives a coloured plate of what he termed a yellow Picotee, but it is not a Picotee at all as we understand Picotees. However, Picotees did not pass entirely out of existence. Probably the yellow Carnations and Picotees we now possess may be traced to the first yellow Carnation recorded in England, which was obtained from Poland and presented to Gerard the herbalist, before 1597, by his friend Nicholas Lete, a worthy London merchant, but there is no evidence that this is so. The yellow Picotees, beloved of Queen Charlotte and the Empress Josephine, were of a rich, deep yellow. This type of flower was taken in hand by a Mr. Richard Smith of Witney, Oxfordshire, about the middle of

last century. He crossed these yellow varieties with the white-ground Picotees, and obtained some varieties of the true florist's form of colouring and marking. My late friend, Mr. B. Simonite of Sheffield, saw them exhibited before the National Carnation and Picotee Society in 1858, and thought them of the highest class in form and markings. The yellow tint of the petals was paler than heretofore, owing to the cross with the white varieties. Smith began crossing in 1847, and it was ten years before he was able to show these perfectly formed flowers ; they did not become widely distributed. A variety named Prince of Orange was introduced in the early sixties—a clear yellow flower, with a well-defined red margin. From this variety a batch of seedlings was raised in the nurseries of Mr. Charles Turner of Slough, some of them exhibiting a considerable improvement on the parent plant. From these seedlings I was successful in obtaining a further advance. Other raisers have since taken the matter in hand, and the yellow Picotee is now perfect in form and markings.

Amongst the later Carnation growers, one name stands pre-eminent as a raiser, the late Mr. Martin Ridley Smith. When he started with the intention of improving the Carnation, he spared no pains or expense to obtain the best varieties. He asked me to go with him to Erfurt in Germany, and we spent a day in carefully examining all the choicest varieties grown in the nursery of Mr. Ernest Benary at Erfurt, and the fancy varieties we selected on that occasion were the parents of the fine varieties raised by Mr. Smith. There were two very good selfs amongst them, a pure-white flower of excellent form, and the perfect yellow self named Germania. This latter variety was the parent of many beautiful selfs of quite different colours.

I was asked by Mr. Smith to distribute the new Carnations raised by him, and they were widely dispersed all over the British Empire. Mr. Smith was also successful in crossing the border Carnations with pollen taken from the Souvenir de la Malmaison type, and he thus obtained quite a new type of Carnation. His eldest son, Mr. Nigel Smith, cultivated yellow Carnations only, and he was successful in raising Cecilia, one of the most popular of yellow varieties. Both these raisers have passed from us, but their work remains, and hundreds of earnest cultivators are raising improved varieties from the stock so freely distributed by Mr. Smith.

PERPETUAL-FLOWERING, OR TREE, CARNATION

The Perpetual-Flowering Carnation originated in the eighteenth century in France; it is readily distinguished from any other type, owing to its habit of producing side growths freely from the main stem. The central growth produces flowers as in the border Carnation, the side growths in their turn furnishing a succession of blooms; and, if the plant is potted on into larger flower-pots for two or three years, a very large specimen can thus be obtained, and the term "Tree" Carnation applied to such a plant is not inappropriate. I well remember, when an apprentice in a provincial nursery in Scotland in 1852–53, a consignment of these new Carnations being sent from London. They produced long, lanky growths in the greenhouse, and miserable-looking flowers. They were planted out and trained to a wall in the summer, growing to a height of 4 or 5 feet, and the stems were very slender. It was about 1865–66 that a variety named *A. Alegatiere* was sent over from

PLATE II

BORDER CARNATION

"DAFFODIL"

France. The variety had quite a low growth, and very pretty scarlet flowers freely produced. English growers, notably Mr. May of Edmonton, produced very beautiful varieties. Miss Joliffe, raised by a gardener, was a favourite variety for a long time; it was a good pink colour. Mrs. Moore, white; Winter Cheer, scarlet; William Robinson, scarlet, and many others followed. In more recent years many beautiful varieties have been introduced from America, but these are within the recollection of everybody.

"MALMAISON" CARNATIONS

The Souvenir de la Malmaison Carnation has been cultivated for some sixty years or more. Souvenir de la Malmaison has very large, blush-coloured flowers; it produced a pink-coloured sport which is also very popular; and a striped variety named Lady Middleton. My cousin, Mr. R. P. Brotherston, says that the original Souvenir de la Malmaison was raised from seed by Mons. Laine, a Frenchman, in 1857. He believes that the sport, Lady Middleton, appeared at Luffness, in East Lothian, in 1870; and the pink Malmaison in 1873, or earlier. There is a crimson form supposed to be a sport, but this is doubtful, as it does not resemble the original variety in the form of its flowers or in its foliage. The varieties raised at Hayes by the late Mr. M. R. Smith are now widely cultivated. The variety Nell Gwynne is large and pure-white. Lady Grimston is marked with red on a pink ground. There are other very beautiful shades of blush, pink, salmon pink, scarlet, and crimson, whilst quite recently this type has been crossed with the tree or perpetual-flowering Carnations, for the purpose of getting perpetual-flowering "Malmaison" varieties.

CHAPTER II

TYPES OF BORDER CARNATIONS

By JAMES DOUGLAS, V.M.H.

THE wild Carnation (*Dianthus Caryophyllus*) is a hardy plant in Great Britain. It has a slender, spreading growth, and clings to old buildings, where it has a perennial existence, with no other sustenance than may be obtained from mouldering bricks, stones, and mortar, besides the small portion of humus which arises from decaying vegetable matter. This wilding was taken from the crannies where it had made its home, and it has been cultivated in rich garden soil for centuries. The altered circumstances have caused the plants to produce double flowers, and they have excited variations which have led to the production of the rich and varied colours now so characteristic of this flower. In order to obtain very large flowers, Carnations are planted in rich soil in the autumn or early spring months, and later in the season the roots are afforded surface-dressings of a still richer compost, with the result that over-feeding predisposes the plants to diseases of various kinds, which are not easily eradicated when once they have obtained a footing.

Before proceeding to give full cultural details for border Carnations, it may be as well to define the various classes or sections into which border Carnations and Picotees are

grouped. It should be understood that the points of excellence in the plant and flower are the same in all sections. In a bed of seedlings, no two plants are alike : some have narrow, wiry leaves ; others are broad and flabby, with numbers of different forms amongst them. The broad, succulent-leaved varieties are most liable to the attacks of disease, and those with wiry, small leaves seldom produce flowers of the highest quality.

The medium-leaved varieties are to be chosen in preference to the others, but these may only be selected from those which produce flowers that possess the qualities of good form, attractive colouring, and agreeable perfume. Having obtained a handsome plant of vigorous habit, it is desirable that it should possess a stout flower-stem that will bear the flowers in an erect position without the aid of wires, even when cut for decorative purposes. The flowers should be of handsome form, and the petals supported by a stout calyx which does not burst. The outer petals should be broad and well formed, what the fanciers term rose-leaved or cup-edged ; the centre petals ought also to be well formed, not wrinkled or of small size. The fanciers of the last century considered that every good flower should possess twenty-six petals ; but nowadays a good double Carnation ought to possess twice that number of petals before it satisfies the criticism of competent judges.

Next as to colour, the original flowers exhibited one colour only, being shades of pink ; and self colours are perhaps most esteemed, being most useful for decorative purposes. The colours are now numerous, and they have been greatly increased during recent years. White flowers

are held in esteem by most Carnation fanciers; the various shades of pink, rose, and salmon colours are held in high estimation; scarlet, crimson, and maroon colours are appreciated by many, whilst yellow of various shades, apricot colours, maize tints, and lavender tints have their admirers. The quality of scent or perfume is essential, and any flower that lacks perfume is far from perfect, no matter what other qualities it may possess.

Next to the selfs must be placed the flowers designated fancies, or what are termed in Germany Bizarres. (The British Bizarre is quite a different flower.) The flowers known as "fancies" possess a wide range of colour, but most of them have one or two colours irregularly marked on a white, cream, apricot, or yellow ground. These were doubtless the first variations from the self colours, and they were generally cultivated with the selfs early in the seventeenth century. Rea, writing about the middle of the century, stated that the "selfs were little esteemed, but those flowers are chiefly valued, which are well flaked, striped, or powdered."

Flakes and Bizarres are comprised in the section beloved of the old florists. For many years they were grown to the very highest pitch of perfection as flowers for exhibition. There is no positive evidence as to the period when the break occurred which was the forerunner of this section. The chief beauty of a Bizarre or Flake Carnation consists in the perfect form of the flowers. The ground should be white, and in the case of the Bizarres, the petals are marked with irregular longitudinal stripes of colour. The Scarlet Bizarres are marked with scarlet and maroon, evenly distributed over

the petals; when the flowers have to pass before the censor on the exhibition table, he looks carefully to ascertain if any of the petals lack both colours. Should any of them show all purple flakes, or all maroon, it used to be a disqualification; but this is not now always insisted upon. The same remark applies to Crimson Bizarres. These are marked on the petals with crimson and purple flakes. Pink Bizarres are marked with pink and purple; but the pinks are a more modern section; the colours are paler, and the older class of florists were reluctant to admit soft or pale tints of pink or rose. Some twenty-five years ago, I remember examining a very beautiful rose flake flower named Dorothy, raised from seed by the late Mr. Dodwell. It was of a soft rose, well marked on a ground of white. I pointed to its beauties in the presence of one of the older florists present, but he turned away with the remark: "I don't like it." The higher the colour, the more the flower was esteemed. The Flakes were never appreciated so highly as the Bizarres. They possess one colour only on the white ground, and they are arranged in the following classes:—Scarlet Flakes, on a white ground, with the colour arranged as in the Bizarres; Purple Flakes; and Rose Flakes. In every class perfection in the form of the flowers is insisted upon. The white ground, especially in the Bizarre classes, is never so pure as is desired, but the whiter it is the more the flower is esteemed.

Many amateurs would grow the Flakes and Bizarres in their gardens, but they have an idea that they are not hardy and that they require greenhouse culture. This is incorrect. I have seen the Bizarres and Flakes successfully

cultivated in Scotland and the North of England out in the open garden ; the best I ever saw were grown in cottagers' gardens in the Tyne Valley. Cultivators allow the layers to be well ripened and rooted before planting. I wrote to one of the best growers at Swalwell near Newcastle-on-Tyne, asking him to give me particulars of the treatment which produced such beautiful flowers. He said that the ground was enriched with manure obtained from the cattle market in Newcastle, that the manure was dug in three months or more before planting to a good depth ; 5 or 6 inches of soil being placed over the manure. The second week in November is the best time for planting, but there is no hard-and-fast rule in the matter. The most important point is that the layers should be healthy and well rooted at the time of planting. They require careful cultivation, but, if this is given them, they grow vigorously.

The late Mr. E. S. Dodwell stated, in one of the numerous papers he wrote on this type of Carnation, that the average life of a variety was about fifteen years. My experience amongst all classes of Carnations is longer than Mr. Dodwell's, and my conclusions are scarcely the same. Take, as an illustration, the variety Admiral Curzon, a scarlet Bizarre ; it is well known to every cultivator and exhibitor at flower-shows of this class. The variety was raised by a gardener named Milwood at Derby in the year 1844, and it is not only still vigorous, but it was awarded the prize offered for the "Premier" bloom in the Bizarre Carnations at the National Carnation and Picotee Society's Show (Southern Section) in 1909. Admiral Curzon has been grown and propagated from layers year by year for a period of sixty-five years. It defies competition ; attempts have

been made again and again to raise seedlings from it, and by cross-fertilising to obtain a better variety, but without success.

The fanciers who grow these Carnations for exhibition prefer to exhibit them on cards, and this method of showing has prevailed for several generations. The object of showing them on cards is that the full beauty of the petals may be exposed. We may say of dressing the Flakes and Bizarres that "it is an art that doth mend Nature." When the flowers are dressed and placed upon the exhibition stands, the art of the dresser goes a long way towards winning the prize; but he must have good flowers to work upon, and, as a rule, the best-grown flowers are sure to win; but if two competitors have flowers of very nearly equal merit, the best dresser will probably win. It is evident, if Flakes and Bizarres are to be exhibited, they must be shown on cards, and the most expert dresser will stand the best chance to win; but it must not be thought that badly grown flowers can be made to surpass those that are well grown, by the mere twisting and turning of ivory tweezers.

The white-ground Picotee is a mere colour form of the Carnation, and it has always been treated as an exhibition flower with the Flakes and Bizarres. Carnation lovers owe a great deal to the old florists who persistently raised seedlings by careful hand-fertilising.

The white-ground Picotees, as we now have them, are a more modern form of the Carnation, but, like the Flakes and Bizarres, they have been classified for exhibition and garden purposes. The flowers should be as good in form as the Bizarres and Flakes. They are divided for garden

and exhibition purposes into six classes — heavy and light red-edged margins, heavy and light purple-edged, and heavy and light rose- and scarlet-edged. The ground colour of the petals is white, and the margin marked with colour sometimes not broader than thin wire, and in other varieties of varying degrees of width. The colour should be marginal only; any markings in the form of spots or bars are defects. It is only in recent years that the highest standard has been reached, and much of the improvement has been the result of work undertaken by amateurs. In the South, the late Mr. Norman of Woolwich raised many beautiful varieties about forty years ago. Mr. Simonite of Sheffield, and Mr. Bower of Bradford, also did much to improve the quality of the white-ground Picotees. These charming varieties of the Carnation are held in high estimation by all tasteful persons.

The Yellow-ground Picotees.—It is only within recent years that any great advance has been made in yellow-ground Picotees. When they were first brought under the care of the florist, they were thought to be of weakly constitution. Hogg, writing in 1820, says: "The yellow Picotee is at all times a difficult flower to grow well in this country, on account of our moist atmosphere and long winters." The Dutch florists have succeeded with it. If placed in a damp situation and over-watered, if it does not perish, it becomes unhealthy, and consequently unable to carry its bloom. A true yellow-ground Picotee has the same properties as the white-ground Picotees. There are many good varieties, and others are constantly being raised, as they are now in the hands of many good cultivators.

CHAPTER III

CULTIVATION OF BORDER VARIETIES

Propagation from Layers.—Border Carnations are usually propagated by layers. The layers have the lower leaves stripped off, and a notch is cut into and through a joint. Layering knives are specially made to do the work in an expeditious manner. The blade is thin and double-edged; it is thrust through the joint, cut downwards and outwards; the portion of the stem adhering to the layer under the joint is cut off, and the layer is pegged firmly into sandy soil purposely prepared for it. The layers should be removed as soon as they are well rooted, and either be planted out or potted up in small flower-pots for the winter, to be planted out in spring.

The Proper Preparation of the Beds is a matter of considerable importance. Complaints are frequently made of want of success in the garden culture of Carnations; sometimes the plants die owing to fungus disease, or they rot off owing to the soil being wet and undrained. If there is a probability of an excess of water, the beds may be made up with good soil from 3 to 6 inches above the surrounding garden level. In every case, care must be taken to ensure that any decayed fibrous loam that is used is free from wireworm. It is very difficult to deal with this pest when it is present in the soil. Gas-lime will kill it; but if a sufficient quantity is dug into the soil to destroy the wireworms, it

also kills the Carnations. The only plan is to carefully pick out the wireworms by moving the soil over ; but even then many are missed during the process. Fibrous turf in a well-rotted condition is certainly the best material for forming Carnation beds, if the staple soil of the garden is not suitable ; and, as turf is very seldom free from wireworms, the loam should be treated in the following manner :— Make a heap of the fibrous loam as it is delivered, adding to every four loads of loam a load of fresh stable manure, mixing the two together. The manure will cause sufficient heat to be generated to destroy all pests contained in the soil, including the wireworms, and the compost will be ready for use in five or six months. If Carnations are planted in beds, four rows of plants in each bed will be sufficient. If the bed is 6 feet wide, the first two rows should be planted 6 inches from the edge ; the rows may be 16 inches apart, and 16 inches should be allowed between the plants in the rows. Autumn-planting begins at about the middle of September, but it may be carried out even as late as the middle of November in ordinary seasons. A few of the lower leaves may be removed from the plants, say one or two pairs, and the layers

FIG. 1.—Showing how a layer is notched before it is pegged down.

should be planted as deep as the base of the lower ones retained. It is a mistake to bury the lower leaves in the soil, because these cause decay, and the decay spreads to other portions of the plant. Plant each layer firmly, and let any tall or unsteady plants be supported with neat sticks. If slugs attack the plants, it is a good plan to dust over the surface of the ground with soot. If sharp frosts set in, place a thin mulch of decayed stable manure amongst the plants. Notwithstanding all the care that may be taken, some of the layers may get broken, or be injured in some other way during the winter. For this reason, it is well to have a number of layers potted up and kept in frames, in order to fill up any blanks that occur in the beds. Two plants may be potted into a 3½-inch flower-pot, or one layer into the centre of a 2½-inch pot.

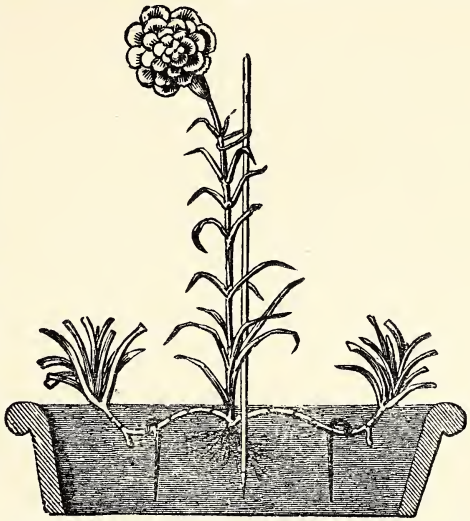

FIG. 2.—Showing how the layers are secured by pegs. (From the *Gardeners' Chronicle.*)

BORDER CARNATIONS IN POTS

Having said this much about border culture, I must point out that the best flowers of border Carnations are

always produced by plants grown in flower-pots. This system of culture is practised by all successful exhibitors, but not, as some allege, because the Carnation is a tender plant which is unable to thrive in the open air. Any amateur, with the least knowledge of gardening, knows that most kinds of flowers are improved by cultivation under glass, and it is much easier to keep them free from insect pests. For house culture it is customary to pot up the layers in September and October, in order that they get well established before the winter. They are generally wintered in garden frames. The lights must be kept rather close for a week after potting up the layers; if they are tilted 2 inches or so at the back, that will be sufficient. In September, if the sun is powerful, a little shade may be necessary, and care should be taken to prevent the plants from suffering any check in any stage of growth. When it is seen that the plants have made some fresh roots, air may be admitted freely, and, after two or three weeks, the glass lights may be removed altogether in fine weather. Watering must be done with extra care. Soon after repotting, an application of water should be made, by means of a fine rose water-pot, to settle the soil well about the roots; afterwards it must be used sparingly and carefully without a rose, as wetting the leaves may be injurious and cause "spot." During severe or prolonged frost in winter, it is well to protect the plants by mats thrown over the glass lights, although they do not suffer much even from prolonged frosts.

About the first week in March is a good time for repotting. A sufficient number of clean pots should be got ready, and clean potsherds for drainage. The soil also ought to be in a fit condition; that is, of a medium degree

PLATE III

BORDER CARNATION

"Elizabeth Shiffner"

of moisture. In the establishment to which I belong, we use a large quantity of loam. It is stacked up six months before using, as previously advised, and we have no trouble with wireworm, or with another pest known as the leather-coated grub. The flower-pots usually preferred are what the pot-makers term 24's and 16's—that is, 24 and 16 to a cast—and they should measure 8 inches and 9 inches in diameter respectively. Two plants are put into the smaller size, and three into the larger ones. When the plants are especially strong and well grown, a larger size is used, namely, 12 to a cast of pots; these have a diameter of 10 inches. Three plants in this large size have an excellent effect. The plants must be potted firmly, and, if the weather is unfavourable, room may be found for them in the frames; but it saves a deal of extra labour if they are placed at once out-of-doors. On one occasion, many years ago, when Flakes, Bizarres, and white-ground Picotees only were grown for exhibition, I had partly finished repotting a collection and the plants were scarcely placed out-of-doors on a hard base formed of ashes before severe weather set in and they were covered with snow. Repotting was discontinued until favourable weather, but, as a matter of fact, those that were exposed to the snow-storm proved quite as satisfactory as those which were not repotted until later.

During the spring months the plants do not require much water; even the repotted plants which have been placed under glass ought not to receive water until the soil is fairly dry, say ten days or so after repotting. If the weather in March is fairly mild, the plants will make considerable growth, and, at about the end of April or early in May, they will need to be supported with stakes,

2 feet 6 inches to 3 feet or so in length. Amateurs will sometimes find in April that the younger leaves are chewed or eaten off, and the cause is not apparent. Sparrows are usually to blame for this, and a good preventive is to stretch lines of white or black threads just above the plants. In the absence of these threads, sparrows may attack the plants whether they are under glass or in the open air. After the flower-stems are tied to the sticks, the sparrows do not interfere with them. The plants are usually grown out-of-doors until the flower-buds are about to show their colour, when they must be removed under glass, if flowers of the highest quality are desired.

During the time that they are out-of-doors they are liable to be attacked by two insect pests, namely, green fly and thrips. The green fly feeds upon the leaves and clusters around the flower-buds in their early stages of growth. The thrips attack the flower-buds when they are fully developed, just as the petals are showing colour. The general treatment for insect pests is described on another page, but I will remark here that the plants should be taken into the Carnation house and be fumigated with one of the nicotine compounds. The flowers will develop rapidly under glass, and, if the flower-buds on a single stem have been thinned out to three, these should develop into large, handsome flowers. Shading should be employed to keep the flowers fresh as long as possible. The flowering time for border Carnations is from the middle of July until the middle of August, and all the Carnation exhibitions are held between these two periods.

CHAPTER IV

EXHIBITING THE FLOWERS

It is within the recollection of the older Carnation exhibitors that self-coloured Carnations, fancy varieties, and yellow-ground Picotees were not always shown at these exhibitions. Now they are the leading features. The flowers are now exhibited with long stems with Carnation foliage intermixed, which shows the beautiful blooms off to the best advantage. The older amateurs, and many of the younger ones, still like to see the flowers displayed on white cards, and to display their beauty to the best advantage they require a certain amount of dressing ; but this latter operation is very often overdone by eager candidates for prizes. The procedure is to make a hole in the centre of the card large enough for the calyx to pass through easily ; the segments of the calyx are turned back, which causes the petals to fall over, and any badly formed or irregular petals may be removed. A pair of ivory tweezers are used to arrange the petals. After such treatment the flower is still the same flower, no addition has been made to it, the petals have not been faked in any way, but the flower is more perfect in its outline than it was before it passed into the hands of the operator. Many people disapprove of dressing in any form, but all flowers exhibited at exhibitions on cards are dressed in some degree. One great advantage of modern exhibitions is in the fact that certain flowers are to be seen

which have been taken from the plants just as they were grown, and these are exhibited with their natural foliage, for comparison with those placed on cards. Considerable discussion has arisen at the meetings of the Carnation Societies as to the best way of exhibiting Carnations, either on cards or without them; but the general feeling of the members is that they should still be exhibited on cards, especially the Flakes, Bizarres, and white-ground Picotees, but that there should also be classes for undressed flowers staged as they are cut from the plants.

CHAPTER V

CROSS-FERTILISATION

For very many years I have given much attention to the raising of seedling Carnations by cross-fertilisation. This is one of the most interesting operations in the culture of Carnations, or indeed any garden plants. Cross-fertilisation may be practised in the case of any type or strain; for example, I should like to see some improvements made in the delightful class of Bizarres and Flakes. The old variety known as Admiral Curzon has remained the best of the former class for about sixty-five years. It may still be possible to raise one with equally good qualities by crossing Admiral Curzon with pollen from the variety Robert Houlgrave. It is always advisable to make this, or any other cross both ways; by this I mean that in one case the variety Admiral Curzon may be the seed-bearer, and in the other case the same variety should be used as the pollen-parent. Cross-fertilising should be carried out in fine weather, when the pollen is in a powdered, not a granular condition. There are always two horn-like processes in the centre of the flowers; these are furnished with short, very delicate hairs, and are the stigmatic or female parts of the flower, to which the pollen or male fertilising agent must be conveyed with a fine brush. The pollen will be found amongst the petals of the flowers in the form of small, yellow globules. If these are touched

with a fine brush, the powder will adhere to the brush, and may be conveyed to the style or stigma by lightly touching it with the same brush. The best time of the day to do this is from 11 o'clock A.M. to 3 P.M. On cold, dull days the pollen is not in a suitable condition to be used. The plants, bearing the flowers about to be fertilised, should be removed to a greenhouse at some distance from the other Carnations in flower. Referring again to the varieties to be chosen as seed and pollen bearers, I would select in crimson Bizarres, Master Fred as a pollen-parent, and John S. Hedderley as a seed-bearer; the variety Sarah Payne as a pollen-parent, and William Skirving as a seed-bearer. Charles Henwood, a purple Flake, should be crossed with the pollen of Gordon Lewis. Sportsman, a scarlet Flake, might be crossed with the pollen of Matador. In rose Flakes, Thalia should be crossed with Merton.

Before giving a list of white-ground Picotees for cross-breeding purposes, it may be as well to state that all the seedlings will not be of the same class as the parents. I was trying to obtain a fine purple-edged Picotee from seed. I therefore crossed the variety, Her Majesty, with another fine, wire-edged variety, and obtained, amongst other good selfs, one which was sent out under the name of Purple Emperor. All the classes of Show Carnations and Picotees have a strong tendency to revert to the self-coloured state.

In heavy-red Picotees, Ganymede should be crossed with John Smith. In the light reds, Thomas William with Mrs. Gorton.

In heavy purple-edged Picotees, Fanny Tett may be

crossed with Mrs. Openshaw. In light, purple-edged Picotees, Lavinia with Somerhill.

In heavy, rose-edged Picotees, Little Phil with Mrs. Beswick; and light, rose-edged Picotees, Fortrose with Ethel.

It would be tedious to make selections in all the classes of Carnations, including yellow-ground Picotees, and it may be sufficient to insist on the importance of selecting varieties with vigorous constitutions as seed-bearers, but they must also possess other good qualities. The pollen-parents should be such as are remarkable for richness of colour and high quality in the flowers; but, at the same time, the more vigour that can be obtained in the seed-bearers, the better.

In the self colours, I always work on the system of keeping each colour distinct, crossing, for example, scarlet with scarlet, and yellow with yellow.

When a flower has been pollinated, it will soon be apparent if the pollen has taken effect, for the petals will droop in twenty-four hours. If this does not happen, the operation must be repeated until the flower collapses. As soon as the petals decay, they should be pulled out, so that the small capsule will be the better exposed to the sun and air. The capsules will frequently damp off in a cold, wet autumn. They can only be saved by keeping the plants in a dry atmosphere, and as near as possible to the glass roof of the greenhouse. The seed ripens about the end of September or in October, and the capsules may be gathered as soon as they develop a brownish colour. The seed is usually black, but sometimes it is merely of a cream colour. The seed-pods should be laid out to dry in an airy room directly they are gathered,

labelling each variety with the names of the seed and pollen parents. After three or four weeks, they will be fairly dry, and the seeds should be removed from the capsules (or seed-pods), as they keep better if made up into packets and placed in a drawer in a dry room.

The best time to sow the seed is in March or April; it germinates best in a slight bottom heat, in a house with an atmospheric temperature of, say, 55°. The seedlings generally appear under such conditions within seven days. They should be pricked out into boxes, putting the little plants at 3 inches apart, and they may be planted in the open ground any time after the middle of May, provided they have been properly hardened to the open air. Any good, deep garden soil will be suitable for them. They require to be set out at 18 inches apart each way, as the plants are capable of making specimens of considerable size. I have counted over four hundred flowers and buds on one plant. I ought to repeat that it is not worth while trying to raise seedlings unless the seed has been saved from the best varieties obtainable. At the same time, amateurs who do not raise seedlings cannot have the pleasure that belongs to those who have new varieties continually opening into flower; for surely there will be some prizes amongst them!

I know one amateur who bought a half-crown packet of seed, and raised from it some beautiful varieties—one of them he sold for twenty guineas.

CHAPTER VI

SELECT LISTS OF BORDER CARNATIONS

THOSE marked with ** should be selected when six have to be chosen for a stand at an exhibition, and those marked with * when a collection of twelve varieties is needed for the same purpose. Six only are marked with one *, as the * and ** together make up the collections of twelve varieties.

SELF-COLOURED VARIETIES

****Agnes Sorrel*, crimson-maroon.
Amy Robsart, white.
Anne Hathaway, yellow.
Anne Boleyn, salmon.
Benbow, buff.
****Cardinal*, scarlet.
Countess of Paris, blush.
****Daffodil*, yellow. (Plate II.)
***Duchess of Wellington*, lavender.
****Elizabeth Shiffner*, orange. (Plate III.)
***Ellen Douglas*, silvery grey.
****Lady Hermione*, salmon pink.
Midas, orange buff.
***Miss Ellis*, lavender.
****Miss Willmott*, deep pink.
Mrs. Griffith Jones.
Mrs. Kearley, medium rose.
Mrs. Robert Morton, apricot.
Renown (new), brownish crimson. (*Frontispiece.*)
***Robert Berkeley*, scarlet.
Robert Bruce, deep apricot.
Splendour, purple.
***T. E. Henwood*, pink.
***Trojan*, white.
W. H. Parton, maroon.

FANCY CARNATIONS

Banshee, lavender colour, with scarlet flakes.
Grand Dame, apricot, with lavender markings.

Chanticleer, marked with rosy red.
***Charles Martel*, a whitish ground flower, with scarlet flakes.
Erl King, buff and rose.
Falca, buff and lavender shades.
***Guinevere*, apricot colour, flaked with rose.
Helena, scarlet and buff.
***Hidalgo*, yellow, marked with red and maroon.
Honourable Dorothy Legge, white and rose.
King Edward, white, with maroon and red markings.
***King Solomon*, apricot colour, flaked with crimson.
Lady Ardilaun, orange and heliotrope.
**Lara*, buff and rose.
**Liberté*, yellow, maroon, and crimson.
**Lord Steyne*, red and crimson on yellow.
Molly Maguire, yellow, with rose flakes.
***Pasquin*, apricot colour, with lavender markings.
**Professor Cooper*, buff, lavender, and pink.
**Rhoda*, white, marked with lavender and rose.
***Rony Buchanan*, terra-cotta and rose.
**Sam Weller*, yellow ground and red.
Sir Lancelot, yellow and scarlet.
The Nizam, white and scarlet.

YELLOW-GROUND PICOTEES

*Archie Brown.
Berenice.
Burgomaster.
Cymbeline.
Delight.
*Exquisite.
*Flora McIvor.
Goblin.
Gronow.
**John Ruskin.
**Lady Avebury.
**Lady Freemantle.
Lady Halford.
Lady Douglas Galton.
**Lord Napier.
*Lucy Glitters.
*Margaret Lennox.
**Mrs. Walter Heriot.
Peregrine.
*Santa Claus.
Solomon Gills.
**Togo.
Village Belle.
William Brocklehurst.

SCARLET BIZARRES

Admiral Curzon.
C. H. Herbert.
George.
Fred.
Robert Houlgrave.
Robert Lord.

CRIMSON BIZARRES

Arline.	C. F. Thurston.	Master Fred.
Bruce Findlay.	J. S. Hedderley.	Phœbe.

PINK AND PURPLE BIZARRES

Fred Phillips.	Princess Beatrice.	Squire Penson.
Harmony.	Sarah Payne.	William Skirving.

PURPLE FLAKES

Charles Henwood.	George Melville.	James Douglas.
Earl Stamford.	Gordon Lewis.	Mayor of Nottingham.

SCARLET FLAKES

John Ball.	John Wormald.	Mrs. Keen.
Guardsman.	Matador.	Sportsman.

ROSE FLAKES

John Keet.	Mrs. Tom Lord.	Pandora.
Merton.	Mrs. Rowan.	Tim Bobbin.

WHITE-GROUND PICOTEES

Heavy-edged Red

Brunette.	John Smith.	Mrs. Lovatt.
Dr. Epps.	Martial.	Princess of Wales.

Light-edged Red

Grace Darling.	Queen of Spain.	Thomas William.
Mrs. Bower.	Souvenir de Headland.	
Mrs. Gorton.		

Heavy-edged Purple

Calypso.	Mrs. Openshaw.	Mrs. Chaundy.
Fanny Tett.	Miriam.	Polly Brazil.

Light-edged Purple

Ann Lord.	Lavinia.	Silvia.
Harry Kenyon.	Pride of Leyton.	Somerhill.

Heavy-edged Rose or Pink

Campanini.	Little Phil.	W. H. Johnson.
Edith D'Ombrain.	Mrs. Sharpe.	W. E. Dickson.

Light-edged Rose or Pink

Fortrose.	Favourite.	Mrs. Ricardo.
Grace Ward.	Mrs. Rudd.	Psyche.

CHAPTER VII

THE MARGUERITE CARNATION

INTRODUCED in the year 1889, this type of Carnation is found very useful for decorative purposes in autumn and winter. There seems to be some misunderstanding as to the source from whence the Marguerite Carnation originated. Mr. Ernest Benary informs me that some say it originated in Sicily; also that Messrs. Dammann and Co. and a Mr. Hildebrand both claim to be the first to have grown the plants. The stock is obtained from seeds which are sown in February or March, and the plants bloom the same season. At this early time of the year the seed-pan must be put in a warm house, and the young seedlings will appear within a week. It is necessary to keep them growing, by pricking the young plants out as soon as the seed leaves are fully developed. They may be grown on as recommended for the seedlings of border varieties, and be planted out in the open border in May or June. Some good potting soil should be placed around the roots of each plant as it is put into the ground, for the purpose of encouraging the plants to make roots, so that in lifting them out of the ground early in September they may not receive much check to their growth. If it is convenient, they may be grown on in pots all through the summer months, and in that case the flowers will be produced early. These Carnations do not

exceed an average height of 18 inches; many of them are not more than a foot high. If well cultivated, they produce a profusion of beautiful flowers. The best seed ought to be obtained, and in that case the larger proportion of the plants will produce double flowers. There will always be a few single flowers, but even these are pretty, and they afford variety. The plants require a temperature of 55° for the flowers to develop to their best. Some amateurs suppose that Carnations will produce flowers in winter in an ordinary greenhouse from which frost is just excluded; but they will not do so satisfactorily. They may develop a few specimens, but they are of poor quality, and not to be compared with flowers produced in a heated house.

Mr. Benary has written me respecting a variety which he describes as much superior to the Marguerite. It is termed the Chaband. I have not seen it, but it is said to flower a month later; it is a better perpetual flowerer; the flowers are said to be finer and capable of keeping in good condition longer, than the Marguerite Carnations.

CHAPTER VIII

THE GARDEN PINK

THIS is the Feathered Pink (*Dianthus plumarius*) or Pheasant's Eye. It is said to have been introduced to English gardens from Eastern Europe in 1629. In Rea's *Flora*, published in 1665, it is said to have been pretty generally cultivated. Rea says that there were many sorts, and they were used as edgings to borders. "The flowers were used for posies, mixed with the buds of Damask Roses; most of them are single, and there are some that bear double flowers, the best, those which are called feathered Pinks; they have broad leaves deeply cut in, and jagged at the edges, whereof there is white, light red, and bright purple, and some with a deeper or paler spot in the middle; the best of these are the feathered Pink of Austria, etc." Rea further adds that: "The Pinks flower with Roses in June, and every ordinary gardener knows how to plant and dispose them." It will be seen from the above quotations that the Pink, from its first introduction, rapidly took its place as a garden flower, and that varieties at this early date had taken on the colour form of our modern laced Pinks. They had the centre blotch, but it is not stated that they had the marginal colour to the petals. Doubtless many varieties were raised from seeds, and as all of them have a delightful fragrance, they would

be always valued for posies, as stated by Rea. It was not, however, until well into the nineteenth century that the Pink ranked amongst "Florist's" flowers, with the Auricula, Carnation, Picotee, Ranunculus, and Tulip. But subsequently, Pink shows were held, and many amateurs took to the raising of seedlings. The leading raisers of Pinks about the middle of the century were Messrs. Norman, Bragg, McLean, Turner, Looker, Hales, Lightbody, Marris, and a few others. There were hundreds of amateur cultivators in Yorkshire, Lancashire, Cheshire, and Staffordshire ; also in the southern districts of Scotland. The fringed petals of the original species and the earlier garden types had, in the varieties in question, been replaced with smooth-edged petals and well-formed, double flowers. It was found that the Pink possessed a robust constitution, and was not affected in the least by our uncertain winters, which are sometimes so destructive to plant life, not so much on account of severe frost, as from the sudden changes of weather, from heavy rains to frosts and thaws alternately. The standard of excellence in the Pink was not settled satisfactorily until about the middle of the century. As usual, the gardening periodicals opened their pages to discuss this question of the standard of excellence. In regard to form, the florists did not approve of the petals with serrated edges, and, after years of careful selection, they obtained smooth, well-formed petals, and flowers as perfect as the best Carnations. In respect to colour, the flowers had a well-defined, dark centre, and the petals were white, with a coloured margin, edged again with white.

PLATE IV

MAGGIE HODGSON

A Variety of the Souvenir de la Malmaison Type

(From the Dover House Collection)

CULTURE OF PINKS

This is a very simple process, and success can be attained with very little practice. The cuttings or pipings are taken from the old plants at about the end of June or early in July. A piece of ground should be prepared on the north side of a wall or fence, and the pipings may be inserted therein. At that time of the year the weather may be hot and dry, but, as the pipings are prepared, they may be thrown into a dish of water, which fills them with moisture. If care is taken to sprinkle them after they are inserted in the soil, they will not suffer at all; or, if they can be planted in a frame, they will strike roots more quickly. Pinks may also be propagated by layering in the same way as Carnations. Some fine compost must be prepared for them, say, one part leaf-mould, one part fine loam, and one part white or river sand. The pipings will form roots in three or four weeks, and they may be planted in beds at about 3 or 4 inches asunder, to be again planted out about the end of September, where they are to flower. Pinks are well adapted for planting in the rock garden, the margin of herbaceous borders, or in beds. The soil for Carnations and Roses suits Pinks admirably—indeed, they are not so particular as to soil as Carnations, and plants, if allowed to remain a second year, or even three years, without removal, will flower well each season; but they should be given a surface-dressing of rich compost, such as a compost consisting of loam and decayed manure in equal quantities. Pinks are perfectly hardy, and capable of resisting the severest winter weather. They are amongst the most

desirable plants to grow in any garden, and particularly where skilled labour is not obtainable.

THE BEST FOUR GARDEN PINKS

Bookham Gem, heavy laced purple flower, with maroon centre.

Snowdrift, large white flower, with delicate, rose-coloured centre.

Rosy Morn, a variety with rosy lilac ground colour and red centre.

Rubican, Vieux rose, with crimson centre.

CHAPTER IX

SOUVENIR DE LA MALMAISON CARNATIONS

By JAMES FINDLAY McLEOD, F.R.H.S.

AMONGST the many types of Carnations, none can compare favourably with that known as Souvenir de la Malmaison. The flowers are richer in colour and sweeter in perfume than those of any other Carnation, whilst a first-class specimen plant, with its handsome, curved leaves of glaucous green, is an object of admiration and a source of pride to the cultivator. It is a source of pride because the "Malmaison" Carnation has not been found easy of cultivation in all gardens; on the contrary, until quite recently, it has succeeded to its best in comparatively few instances. The cause may be reasonably attributed to imperfect knowledge on the part of the cultivator, or shall I say to a failure to thoroughly understand the peculiar habits and requirements of this type, which certainly differs in some respects from all others? At the same time, the general culture is not very different to that afforded the tree or perpetual-flowering varieties, in its main characteristics, the chief variation being that the Malmaison plants require a cooler atmosphere, especially during winter, when they must not be subjected to anything likely to stimulate them into making growth.

Much has been said and written as to the adaptability

of the Malmaison Carnation for culture in association with other subjects, but, after more than twenty years' experience, I must maintain the opposite view. They may doubtless be grown in some fashion amongst other plants, but the best results can never be obtained except in cases where a house is devoted exclusively to their requirements.

I have grown them in various structures, but prefer a house which has east and west aspects, as, for instance, a span-roofed structure extending north and south. For plants two or three years old, the house should be about 20 feet wide and 10 feet high, and it should be fitted with side stages; but one with a lower pitch is better adapted for younger plants.

The heating apparatus should consist of a 4-inch flow and return water-pipe on either side of the house, placed under the benches. These will provide enough warmth to exclude frost, which is all that is needed. For providing a base for the pots to stand upon, small coal is to be preferred, but shingle, or gravel, may be used, if circumstances make them desirable.

Propagation.—There are two systems of propagation, namely, by layers and cuttings, just as in the case of other Carnations. My experience has shown that the very best stock is obtained only from layers, and it is this method which I recommend beginners to adopt. In the first place, before any form of propagation is begun, it is necessary to examine carefully the specimens to be employed as stock plants, and, if any pest is found, every means should be taken to eradicate such pests before removing the plants to the frame ground. In most private gardens, it is generally found that the frames which have been used for early

vegetables and bedding plants are convenient for layering Carnations, as the vegetable frames have soil already in them, and it is only necessary to add a little leaf-mould and sand. A glass covering is essential, as it is unwise to expose the foliage to the moist atmosphere out-of-doors. After the stakes which support the shoots have been removed, the plants should be laid on their sides, arranging them so that the growths can be prepared for layering without unduly twisting them, for they are very brittle. The leaf-mould and sand having first been passed through a sieve with a ½-inch mesh, the operator should take the growth to be used in his left hand, and, at a convenient length, say, about 3 inches, remove the leaves and make a cut in a slanting upward direction—similar to that described by Mr. Douglas for border varieties—of about 1 inch in length (or, in other words, split the stem in half). This should then be gently, though firmly, pressed down into the rooting material, which should consist mainly of leaf-mould and sand, using a layering peg for the purpose. A good watering should be applied, through a fine rose, directly the layers are planted. Later waterings should be done early in the morning, when the prospects for a fine day are favourable, removing the frame-lights until the "grass," or foliage, is quite dry. On replacing the lights, ample provision should be made for the admittance of air, and, in bright weather, the plants will need shading from direct sunshine. Beyond the necessary shading and watering, nothing further can be done until the layers have made sufficient roots to allow of the plants being severed from the parents and transferred to pots.

Potting.—The greatest possible care should be exercised

in the selection of the proper soil, and in its preparation. There is no better material to form the main part of the compost than the top spit of an old pasture, where the soil is a rich loam inclined to heaviness. Such loam should be stacked for a few months before it is used. It should be broken up by the hand and passed through a 1-inch sieve. To mix with this staple, some leaf-mould, formed of decayed oak leaves, is desirable, and sufficient sand should be used to make it an easily handled compost. The leaf-mould, like the loam, should be passed through a sieve. A little soot, and a sufficient quantity of Thomson's vine and plant manure to fill a 5-inch pot, if added to each bushel of the compost, have stimulating effects, which should not be overlooked. The most suitable pots are those known as 60's, which have a diameter of 3 inches. If they are quite new, they will require immersion for one hour in clear water; and if they are not new, they must be washed perfectly clean—in either case allowing them to become quite dry before use. Not much drainage is required at this potting, as the plants will soon need moving into pots of a larger size. A few pieces of broken charcoal, with a thin layer of moss placed over them, forms a very safe and effective means of drainage for the small pots. In lifting the layers from their rooting quarters, every care should be taken to preserve the roots from getting broken, and the root-mass should be so trimmed as to prevent any difficulty in placing the layer in the pot. A small quantity of the rougher portions of the prepared soil should be placed over the moss, and firmly pressed with the hand; then place the young plant in position, making it about half an inch lower in the soil of the pot than it

was in its original quarters. Firm potting is necessary, but not any ramming with a rammer, as is sometimes practised. When the potting is completed, the soil should be half an inch below the rim of the pot. Each plant should then be secured to a neat, green-painted stake, and placed on a bed of ashes or small coal, in a cold frame or some such structure. Beyond careful watering and judicious airing, nothing further is required, but shading the plants when bright sunshine prevails. Assuming that the plants are potted early in September, they will be ready for a further shift at about the end of October. The pots for use on this occasion should be 6 inches in diameter, and very firm potting must be carried out. The compost for use at this and subsequent pottings should be similar to that recommended already, except that, in the larger-sized pots, it should be left slightly rougher in character. As spring approaches, the plants commence to make roots, and young growths may be observed pushing up from the axils of the leaves near the base of each plant. When these shoots are sufficiently large to handle, they should be thinned out to about 8, 10, or 12, according to the strength of the plant. These, in their turn, as the season advances, will require to be supported each with a stick, arranging them so that each shoot will have ample room and proper exposure to the sunlight, keeping in mind the fact that the more robust the plant, the better it will flower.

The flower spike will appear with numerous buds upon it, but only one can develop into a really good flower, therefore all the lower buds should be removed as they appear. To ensure the flower having a perfectly symmetrical

surface, various methods have been tried with more or less success. For my own part, I like to see a "Malmaison" flower in its true and natural state; it should not look quite so formal in character as a border or tree Carnation. Where, however, it is desired to ensure uniformity, a very slim elastic band should be used; this is a neat and satisfactory method of gaining this end. The band should be placed on as soon as the bud approaches the bursting stage, for, if not done before the calyx bursts, little good will be served. When the flowering season is over, the plants should again be overhauled, and any that have not developed a good number of growths should be put aside for layering purposes, but the others may be repotted into 9-inch pots for forming specimens in the following season.

Watering.—So much depends on the careful use of the watering-can, that I cannot too effectively impress its importance upon those who have charge of a collection of these plants. It is well known amongst gardeners that the injudicious use of water, indispensable as this element is for all plant growth, is the cause of frequent deaths amongst plants cultivated in pots. I believe it to be true that improper watering is responsible for more failures than all other causes taken collectively. But what has to be stated is that Malmaison Carnations are unusually sensitive to the effects of over-watering, and they soon show, by a peculiar paleness in the foliage, if excessive moisture at the roots is causing the growth to become debilitated. This is more noticeable in winter, when the plants are in a semi-quiescent state; at this period we water our plants but very rarely, and, on these infrequent occasions, it is carried out when the weather is so favourable that the excessive moisture

is readily absorbed in the atmosphere. The damping of paths and other surfaces is discontinued entirely during winter.

Need for Ventilation. — Abundant air must be admitted to the structure at all times. Plants which are grown in a close, badly-ventilated house, never produce flowers of the best size or colour, but their health is impaired and their energies weakened. In cold or wet weather in winter, it is desirable to employ just enough fire-heat to warm the water-pipes; but, unless there is severe frost, the ventilators should never be closed. In this, as in every other detail, the cultivator must exercise his judgment, as it would be harmful to open the ventilators facing to the east when the wind is blowing from that quarter. In a word, and I hope I may be understood, adequate ventilation is absolutely necessary to produce the best results.

Feeding the Plants.—So long as the plants are in 6-inch pots, there is no need to apply any stimulant, as they are still young, and their energies are not taxed by the production of flowers. But after they have been potted into the larger-sized pots, and they have to sustain a quantity of foliage and flowers, occasional dressings of this nature are necessary. The stimulants should be applied in a liquid or other form, in small quantities. Moderate applications, given more or less frequently, are safer and better than excessive quantities. Carnations must be treated with far greater care in this respect than such a gross-feeding plant, for example, as the Chrysanthemum. I usually apply a top-dressing in February, just as the plants are commencing to grow, and another

in March, when the flower-spikes are in course of development. These are the two principal seasons when feeding by top-dressings is particularly necessary. In the case of plants which are grown throughout the year in the same pots, a third dressing is necessary as soon as the flowering season is over, say, in June. I have found Clay's Fertiliser a most valuable stimulant, and I use two parts of this manure to one part of bone-meal. The loose soil on the surface is removed, and then this mixture is applied at the rate of a tablespoonful to a 9-inch pot, and a proportionately larger quantity to plants in pots of larger sizes. A dusting of fine soil, consisting of loam and leaf-soil, should be placed neatly over the manure, and a good watering afforded with slightly warmed water. Between the seasons when top-dressings are applied, diluted farmyard manure water, in which a sack of soot has been allowed to soak, may be given about twice each week with advantage. It will cause the foliage to appear exceedingly healthy, and it will invigorate growth.

Pests and Diseases.—Like most other plants when grown under glass, Malmaison Carnations are liable to the attacks of insect and fungal pests. The chief pest is the well-known green-fly, which soon disfigures the foliage if its presence is not quickly detected. Occasional fumigations with the X.L. All Vaporising Compound will keep the pest in check. Red Spider is apt to make its unwelcome appearance, especially in hot, dry weather, and it must be combated with a fairly strong application of the vaporiser, repeating it on two or three alternate evenings.

A fungus known as *Uromyces Dianthi* appears as coffee sprinkled on the foliage and stem of the plant.

The spread of this disease is favoured by damp conditions. On its appearance, the affected part should be cut away with a sharp knife and burnt. It is most prevalent in autumn and early winter. The structures should be kept as dry as is possible, consistent with the maintenance of the plants in good health, using as little water as possible, and admitting air freely except during driving rains. A slight heat should be kept in the water-pipes to prevent condensation, and, with judicious care, the plants should soon grow out of this disease if they are not too badly affected. Should the attack be very severe, the best thing to do is to burn the plants and obtain a clean stock, as the efforts to stamp out the disease will cost more than the purchase of fresh plants. The chief point to remember is that well-grown, vigorous plants are better capable of resisting the attacks of all pests than plants which exhibit a weakly condition through mismanagement.

Temperatures.—If high temperatures are allowed, the plants soon show ill effects in the weakened state of the growth and foliage. In the winter months, assuming the weather is mild, a night temperature of 45° is suitable, and it may rise during the day by solar heat to 50°; but in spells of severe weather 5° less all round is necessary to the health of the plants. When growth is apparent in the spring, the temperature may be raised slightly; but later, in early summer, considerable difficulty will be found in keeping the temperature as low as is desirable.

Shading.—At no time during the season must the plants be placed out-of-doors, notwithstanding that this practice is sometimes advocated. The chief reason for keeping them

in the houses or frames is that out-of-doors the foliage is apt to get soft, owing to wet or damp weather, and it then falls an easy prey to a fungus disease. Therefore I repeat that a glass covering of some form is necessary for the plants at every season of the year. At the same time, the plants require to be fully exposed to the direct rays of the sun during the greater portion of the year, as these conditions are necessary for the foliage to develop that vigorous and leathery appearance which is appreciated by all Carnation lovers. In very bright weather, when the plants are in flower, it is advisable to protect the latter by shading. If the deep pink colour is to be maintained, a moderately light shading fixed on to a roller, which can be easily manipulated, should be adopted, as this is the best form of shading.

Moisture.—I am tempted to allude again to this matter, being convinced that moisture is applied often to the detriment of the plants, not alone in root-waterings, but also when used in the structure to mitigate the ill effects of excessive fire or sun heat. It is only during March, April, and May, when growth is rapid and the weather conditions favourable, that frequent dampings of the paths and other surfaces are necessary.

SELECTION OF VARIETIES

The old blush form of Souvenir de la Malmaison was first flowered in this country at about the middle of the last century, and for many years it remained the only variety. A variety known as Lady Middleton followed, and this had a deep blush-coloured flower, striped with rosy pink, and it in turn was followed by the rich pink form known as the

PLATE V

PRINCESS OF WALES

A variety of the Souvenir de la Malmaison type

(The specimen illustrated was cultivated by Mr. McLeod at Dover House Gardens)

Princess of Wales. It was not until the late Mr. Martin Smith of Hayes, Kent, commenced to cross them, that the many charming varieties now in commerce were obtained. All lovers of Carnations owe a deep debt of gratitude to him for his indefatigable exertions in this direction. It is true that the pink form is still more generally grown where large quantities of flowers are required, but in most gardens the newer varieties may now be seen in their many shades of colour, which range from pure white to crimson. Amongst the more popular varieties are those following :—

Albion.—Deep salmon in colour; a most vigorous grower which ought to find a place in all collections.

Baldwin.—A large flower of clear rose-pink colour. It possesses a very vigorous habit.

Calypso.—A large, full flower of pale rose tint. Very fine.

King Oscar.—Rich crimson, distinct in form, and a most desirable plant in every way.

Lady Grimston.—A pinkish-white flower, distinct in habit, richly scented, and a plant that may be recommended to all.

Lady Rose.—A bright rose-pink flower, medium in size, and very neat.

Lord Welby.—Distinct in form, this flower is a rich, dark crimson. The plant possesses a good constitution, and is one to be recommended.

Maggie Hodgson.—This is one of the best varieties for general purposes, as it possesses a vigorous constitution, has deliciously scented flowers, and the colour is a rich, dark crimson. (Plate IV.)

Marmion.—A variety of recent introduction, which bids fair to become very popular. It has a white ground, which is prettily marked with rosy red, and this, forming a minor margin, makes it quite a fresh break.

Mrs. Trelawny.—A rich salmon-coloured flower. The plant has a sturdy habit which is appreciated.

Nautilus.—One of the prettiest of the pink varieties. It has a large flower and an excellent constitution.

Prime Minister.—A bright scarlet variety of medium size. I strongly recommend this variety of sturdy habit.

Princess of Wales. Rich pink. (Plate V.)

Soult.—A distinct, salmon-tinted flower.

Churchwarden.—A very large, full type of crimson, possessing a vigorous habit.

The Queen.—A large-flowered variety of a deep apricot colour. The constitution is not robust, and the plant requires very careful culture.

Yaller Gal.—A medium-sized flower of bright yellow colour. This variety requires care, but, when well grown, it is a beautiful flower.

CHAPTER X

PERPETUAL-FLOWERING CARNATIONS

By THOMAS H. COOK, F.R.H.S.

To France belongs the honour of having, some sixty-seven years ago, raised the present type of Carnation which is distinct from all others in its habit of perpetual flowering. Mons. Dalmais and Mons. Schmidt, of Lyons, were the pioneer raisers of this race, which was obtained from the remontant or monthly Carnation crossed with the Flemish Carnation, the offspring of these in turn being carefully selected and recrossed with each other about twenty years later by Mons. Alegatiére, also of Lyons, who distributed what were then called the Tree Carnations. There is reason for supposing that tree Carnations were cultivated in France nearly one hundred years earlier, but it is to the more recent date that we must ascribe that development which has played the most important part in the spread and popularity of the Perpetual-Flowering Carnation.

About the year 1852 the old tree Carnations engaged the attention of American floriculturists, and a French florist of New York, named Mons. Marc, raised several seedlings of the remontant type, from seed sent from France. At a later date Messrs. Dailledouze, Zeller, and Gard secured seed from the same source, from which they raised the first American plants. During the next twenty years, enterprising horticulturists in various parts

of the States, impressed by the possibilities of the Winter-flowering Carnation as a market flower, commenced to cultivate it, whilst some, at least, attempted cross-fertilisation, the result of this latter work being the splendid type of flower now largely cultivated in the gardens of this country. The Tree Carnation was introduced into England from France about the year 1853 ; but the progress of development was not so marked or rapid as in America. Indeed, until quite recent years but few varieties of first-class quality were raised in this country.

The English National Carnation and Picotee Society was formed in 1850. Previous to that date, border Carnations were grown well and extensively, but it was not until December 1905 that steps were taken to form what is now known as "The Perpetual-Flowering Carnation Society." Although we have lagged behind our American cousins in raising new and improved varieties, nevertheless progress is being made by such firms as Messrs. Low, Cutbush, Veitch, Dutton, Burnet, Clarke, and others, although it is noteworthy that varieties of American origin still hold conspicuously high positions in the lists sent out by the nurserymen who make a speciality of Carnations of this type. Owing to adverse climatic conditions, it is unlikely that we shall ever compete successfully with American-grown flowers in the depth of winter. The American winter is characterised by a bright, clear, and sunny atmosphere, which accounts, to a great extent, for the successful production of first-rate flowers there during our four dullest months of the year.

Regarding cultivation, Johnson remarks in his *Gardeners' Dictionary:* "There is a variety called the 'Tree Carnation,' which answers best for forcing. The plants should

not be allowed to flower the first year, but should be repotted when rooted, into 8-inch pots, the tops nipped off to make them bushy, and no flower-stems allowed to rise till the autumn following." Such was the general practice until a few years ago ; but, with the advent of the freer-flowering, more robust Carnations from America, the methods of cultivation have changed completely, and better results are obtained from a nine- to twelve-months-old plant than used to be got from those of two years' growth.

In many gardens Perpetual-Flowering Carnations have, to a large extent, supplanted the hard-wooded greenhouse plants, and the houses in which these latter were cultivated have been converted into Carnation houses. I would say to those about to enter upon the cultivation of Carnations for winter flowering, that the most important item to bear in mind is the selecting or building of a house in such a position as will ensure the greatest amount of light. The structure should consist of the maximum amount of glass and as little wood as is consistent with the stability of the structure. I know of no plant which will give the successful cultivator such a good return for his time and labour, nor have I met any one who does not appreciate the charm of a house of Carnations in mid-winter. The flowers may be used with advantage in every form of floral device, and for vase and dinner-table decoration none is more appreciated. What could be more lovely than a vase lightly arranged with the varieties Enchantress, Beacon, or White Perfection, carrying their perfectly shaped flowers on long, reed-like stems, three or four buds overtopping the flowers, and a few shoots interspersed and hanging over the sides ?

Carnations always look best arranged with their own

foliage, and even a gentleman's button-hole flower, or lady's spray, should be backed with a little of the beautifully curled, grey-coloured foliage.

The Perpetual-Flowering Carnation, although its hardiness to withstand our winters has yet to be proved, may be as successfully flowered in the outdoor garden as under glass. One of the most lovely flower-beds I have seen was one composed of Winter-Flowering Carnations, planted out after doing duty for a season in the greenhouse ; it quite out-classed, by its continuity of flowering, a bed of border Carnations adjacent to it. The best results, however, are obtained from young plants, for these will not only flower during the summer, but also until the autumn frosts commence.

Good effects may be obtained by growing them in hanging baskets, or training them up the rafters of a greenhouse, or on a trellis at the end of a house, and in these positions, with the flowers allowed to hang loosely and gracefully, the effect is charming. For the former method, plants of a dwarf or stocky nature are best, but for the two latter, those of a tall habit of growth are preferable.

Construction of Carnation Houses.—To those about to build a house for Perpetual-Flowering Carnations, the matter of greatest importance is the necessity of obtaining all the light possible, an adequate system of ventilation, and sufficient hot-water piping to easily maintain a minimum winter temperature of 50° without unduly heating the water, rather erring on the side of providing too much than too little piping. Span-roofed houses are best for general purposes, but it is not very important whether the ridge

extends east and west or north and south. Taking the year through, I have found that plants do as well in the one kind of house as in the other. Provision for ample ventilation at the top and bottom of both sides of the house is imperative. For warmth in severe weather, and shade when needed in summer, it is an advantage to have some form of roller-blind shading affixed to the exterior of the roof. The glass should be of the best twenty-one ounce, and I favour panes 24 inches long and 15 inches broad. The woodwork should be as light as possible, where strength is required employing round or T iron in place of heavy wood, thereby reducing these surfaces which unduly shade the plants in winter. Large growers prefer span-roof houses, 28 to 30 feet wide and 16 to 18 feet high, of varying lengths, built upon brick walls 3 feet high, and having 2½ to 3 feet continuous side ventilation, and side and central stages or benches. Any modification of this style of house may be adopted. A smaller and very useful house, without a central stage, is one 9 feet high at the ridge and 13 feet wide over the walls, which in this case should be 2½ feet high, with the same provision for side ventilation as in the larger house. It is necessary to provide side stages (which may be easily converted into benches, as advised on page 84, if desired), each 50 inches wide, and a pathway 3 feet wide through the centre. For a house this size, four rows of 4-inch hot-water piping at each side of the house is ample to maintain the necessary heat; and, as the pipes will be fixed below the stages or benches, it must be seen they do not come too close to them to cause excessive drying of the roots.

CHAPTER XI

PROPAGATION OF PERPETUAL-FLOWERING VARIETIES

PERPETUAL-FLOWERING Carnations are propagated by seed, cuttings, and layers, but for cut-flower purposes cuttings are best, and these are generally employed. A great deal depends upon the cutting, and its proper treatment at the commencement. The first essential, therefore, is to see that the cuttings are obtained from clean, healthy plants; and the next, to take care that they are grown without undue forcing, either by heat or strong stimulants. Where large batches of one variety are grown, it is often seen that some plants are more vigorous, free-flowering, and the calices more perfect than others; cuttings should be taken from such as these. The perfect cuttings are formed from the short-jointed side growths, which are produced freely by healthy plants of most varieties. These should be taken off with a heel, or portion of the bark of the main stem, attached, which is easily secured by pulling them off with a downward jerk. They need but little preparation, beyond removing two or three of the basal leaves. Shoots which are seen to be running to flower should be avoided, as well as the growths at the base of the plants, these having been found to produce unfloriferous plants. With some varieties it is a difficult matter to procure sufficient cuttings for the winter propagation, owing to their free-

flowering habit, but this difficulty may be overcome by selecting a few plants and cutting back the flowering shoots late in autumn, when a number of growths will be formed which will be found suitable for winter cuttings. Whilst propagation by cuttings may take place at any season, the cultivator must be guided in this matter by the time of the year the flowers are required. December, January, and February are the principal months in which to raise plants for flowering in the succeeding winter. Growers in Scotland will find that plants rooted in October will yield excellent results, provided they are kept growing steadily without a check during the dull days of winter. They should be potted into 2½-inch pots in mid-November, and again into 4-inch and 5-inch pots in January, by which time the shoots will have been pinched once, and a foundation laid for the future plant.

Preparation of the Cuttings.—Select strong, short-jointed side shoots, 4 to 5 inches long, with a heel, if possible; but if this cannot be retained, and it is necessary to cut the shoot, let it be cut with a sharp knife just below a joint. Remove the bottom pair of leaves in preparing the cutting. There are various methods of rooting the cuttings, but whatever method is adopted, they must be kept perfectly fresh, and not allowed to flag or droop by exposure to the sun or a dry atmosphere. Where large numbers of cuttings are propagated, a sand-bed is most generally employed as a rooting medium. Sand, or a light, sandy compost, to the depth of 3 or 4 inches, is placed in the propagating frame, in a house having an atmospheric temperature of 55° to 60°, and a bottom, or sand-bed heat of 60° to 65°.

The cuttings are dibbled thickly into the sand, and afterwards watered in with tepid water. If all goes well, they make roots in little more than a month, and they are then ready for potting off.

Another method by which I have been successful in raising many thousands of young plants, is to insert four cuttings around the sides of 3-inch pots, in a compost consisting of two parts sharp sand, one part loam, and one part leaf-mould, the loam and leaf-mould being first sterilised. The pots are thickly surfaced with sand, and a little sand is forced into the holes made by the dibber, in order that the base of the cuttings shall rest on this material. The pots are plunged to the rims in a bed of moist cocoa-nut fibre, in a propagating pit having an atmospheric temperature of 55° to 60° and a bottom heat of 60° to 65°. The cuttings are given a thorough watering to settle the soil, and, as a rule, no more water is necessary until the cuttings are rooted. It is necessary to provide shade from bright sunshine, and to wipe the moisture from the inside of the lights each morning and afternoon. Should excessive vapour arise in the pit, afford a little ventilation until it is dispelled, and thus prevent damping. When the cuttings are rooted, the pots should be stood upon the surface of the bed, and by degrees the lights should be tilted, and the young plants gradually inured to the general atmosphere of the pit. After they have been in this position for a few days, they should be removed to a stage close to the roof glass in a house having an atmospheric temperature of 55° by night, and 60° to 65° by day.

Yet another method, and one which amateurs usually practise successfully, is that of the frame and old-fashioned

hotbed, composed of oak leaves and long stable manure, upon which a depth of 4 inches of fine peat, or cocoa-nut fibre, is placed; in this material the pots containing the cuttings are plunged. This system we practise with success in the summer and autumn months in a frame having a northern aspect. This method is not recommended for winter, as it is impossible to give proper attention to the cuttings without admitting cold air to the frame.

Propagation by Seed.—This system of propagation is the most interesting, and at the same time the most uncertain in its results. There is a great fascination in awaiting the first opening flowers of cherished seedlings, and, although most of them may prove to be worthless, the joy of having secured one gem will compensate for the many disappointments. To any one interested in the cross-fertilisation of the Carnation, the process is a simple one, but a little experience is necessary to determine the proper time at which the pollen is in a correct state for its transference to the stigma of the flower to be operated upon. Mr. Douglas has described the process of cross-breeding on another page, and I shall merely make a few remarks in passing. The pollen should be removed from the anthers when it is in a dry, powdery condition, by means of a small brush, and applied to the stigma. The stigma is at a proper stage for the reception of the pollen when, upon examination, a clear watery substance is seen to exude from its hair-like filaments. The seed-bearing parent should have its anthers removed from the flowers before the pollen becomes ripe, otherwise the flower may be fertilised with its own pollen, and, unless the plant is isolated, it may be necessary to cover the stigma to prevent any but the desired pollen reaching it.

These precautions are not required where it is not needed to keep a record of the cross—that is, the names of the pollen and seed-bearing parents. Hybridisation may take place at any season of the year; but during the winter little is done, owing to the absence of pollen. When fertilisation has taken place, the flower begins to wither, and in about eight or nine weeks the seed ripens. Care must be taken that the seed is not lost by the seed-pods bursting. To prevent this, the pods may be secured in tissue-paper bags as they approach the ripening stage. Early spring is the best time to sow the seeds, sowing them in pots or pans in a compost of equal parts of loam, leaf-mould, and sand, finely sifted. Take the precaution of sterilising the compost to kill seeds of weeds, and insects. Sow the seeds thinly, and cover them lightly with the compost. Do not water with the watering-can, but plunge the pots or pans up to the rims in water until it is seen to permeate to the surface of the soil; afterwards, stand them in the propagating frame, and place a square of glass over each until germination takes place, which should be in a few days. Gradually inure the young seedlings to the light; grow them on a shelf close to the roof glass; exercise great care in watering, and shade them from bright sunshine. When the seedlings have made three leaves, prick them out, at about 2 inches apart, in a similar soil to which the seeds were sown in, and, later, pot and treat the plants much in the same way as cuttings. As it is desired to prove the worth of the seedlings as soon as possible, they should not be stopped more than once, and that when about 6 inches in height, allowing the shoots which will follow to flower. The seedlings having flowered, the most promising only should be re-

tained for further trial, as it usually takes two, and sometimes three years to determine whether they are valuable.

The flower, not less than the plant, must possess some outstanding merit before it can be classed with the best. It is unfortunate that some of the finest Carnations, remarkable for their beauty in form and colour, should lack the perfume so characteristic of the "Malmaison" and old Clove Carnations. A flower of Enchantress, if it possessed the perfume of an old Scotch Clove, would indeed be an acquisition, and it seems to me the present type at its best can hardly be improved upon except in this direction.

Seed of the Perpetual-Flowering Carnation may be procured from most seedsmen, and can be relied upon to produce plants yielding a fine display of flowers of varied colours, both in the open garden and in pots, or planted out under glass. A small percentage of these will have single flowers, but even the single flowers are not to be despised for cut-flower purposes. As a guide to the good qualities a perfect plant and flower should possess, I cannot do better than quote The Perpetual-Flowering Carnation Society's standard of pointing, one hundred points being the maximum number obtainable by the perfect plant and flower :—

"Colour	20 points
Size	20 ,,
Fragrance	10 ,,
Substance	10 ,,
Calyx	5 ,,
Habit of Plant	20 ,,
Form	15 ,,
	100 ,,

"A variety must gain at least 85 points to entitle it to a First-Class Certificate, and 75 points to entitle it to an Award of Merit."

Propagation by Layers.—Layering as a means of propagating the perpetual-flowering varieties has become almost obsolete; nevertheless, it is a sure way of obtaining young plants if a difficulty is found in rooting cuttings. Turn the plants to be layered out of their pots into a frame, planting them on their sides in a slanting direction, thereby bringing the growths to be layered in contact with a finely prepared compost, into which they are layered in the same manner as practised in the case of border Carnations.

CHAPTER XII

CULTIVATION OF PERPETUAL-FLOWERING VARIETIES

POTTING is an operation requiring much skill and experience, for the operator must thoroughly understand the plant to be potted, and know the nature of the soil best suited to its requirements. As soon as the Carnation cutting is well rooted, it should receive its first potting into clean pots, 2½ inches in diameter. A suitable compost is one consisting of two parts best loam, one part leaf-mould, and equal portions of coarse sand and fine old mortar rubble. The loam and leaf-mould should be passed through a ½-inch sieve. To every barrow-load of this compost, add a 5-inch potful of soot, a 7-inch potful of bone-meal, and a 3-inch potful of Veltha Powder. At each potting, but this one more particularly, make sure that the temperature of the compost is not materially lower than the atmosphere of the house in which the plants have been growing, or it may cause a chill to the young roots. There are various ways of warming the soil. The simplest way is to spread it out thinly on the previous night on mats on the floor of the propagating or other hot-house, or, if the loam and leaf-mould are sterilised by roasting on a sheet of iron over a wood fire, the compost may be used before it loses its warmth. This sterilisation is necessary to kill the larvæ of wireworm and other insect pests. If it is possible to pot on the

cuttings in the house to which they were removed from the propagating pit, let this be done; thus there will not be any risk of a check by exposure to a colder atmosphere. Shade the little plants from bright sunshine until they are established, affording air on every favourable occasion. The next potting will be into 4 and 5 inch pots, and a similar compost to that described already may be employed, except that the loam may be put through a coarser sieve, and the pots must be well drained. At the beginning of May, if all has gone well with the December and January cuttings, they will be ready for their final potting into 6 and 7 inch pots. At this potting the compost should consist of best loam two parts, chopped up roughly, leaf-mould one part, preferably from two-year-old oak leaves, and old mortar rubble and sand one part. To every barrow-load of compost, add the same quantities of soot, bone-meal, and Veltha Powder as in the former potting, with the addition of a 5-inch potful of Carnation manure. The whole should be thoroughly mixed, and allowed to lie in a heap for a few days at least, before potting. In the earlier pottings the compost is made moderately firm in the pots, using the fingers for the purpose; but at the final potting, with a free, open compost, such as advised, a rammer, having one end wedge-shaped and the other blunt, may be used to make the soil firm, employing the wedge-shaped end of the rammer to firm the soil round the sides of the pots. Hard-potting is conducive to a short-jointed, firm growth, such as produce the finest flowers.

Two-year-old Plants.—For furnishing the centres of large central stages, one-year-old plants, potted on, are invaluable the following season. In some varieties, notably

PLATE VI

WINSOR

(Perpetual-Flowering variety)

that known as Enchantress, the flowers thus produced are exceedingly fine. It is not good practice to cut these plants down into the hard woody growth for the purpose of getting a dwarf, bushy specimen ; but simply cut back the flowering stems and the growing shoots. Two-year-old plants invariably become tall and leggy ; but the shoots may be twisted around four or five stakes set in the sides of the pots, and the growing points turned upwards. These tall plants are most useful for placing at the back of groups, or for providing central plants in stage arrangements.

Previous to potting on the one-year-old plants, they should be given a slight pruning, as recommended above, about the end of February, afterwards placing them in a house where the atmospheric temperature is 55° to 60°. The plants should be watered but sparingly until they have started into growth, but on bright days, lightly spray them over with a syringe in the morning and afternoon. By the month of April they will have made numerous young shoots, and be ready for potting into 8, 9, or 10 inch pots, in which they will flower during the following winter. In potting, do not disturb the roots, beyond removing the loose drainage and surface soil. Cultivate the plants in the same conditions as they were grown in previously, and treat them during the summer in the same way as the younger plants.

SUMMER TREATMENT OF POT-PLANTS IN THE OPEN

The final potting over, the young plants are returned to their houses, pits, or frames, where they are grown on as before, gradually hardening them off, until, if desired,

they may be grown entirely in the open for the summer months. With many, this is a necessity, for the want of sufficient accommodation ; but I think plants so grown suffer a disadvantage, particularly in dull, wet seasons, compared to those grown in light, open houses, or having the protection of frames, where they can be controlled in regard to watering, fumigating, and other matters.

There are some varieties, notably Mrs. Burnett, Nelson Fisher, and those of the Lawson type, which become subject to the rust fungus, and other troubles, if the out-of-door practice is persisted in. However, if the plants must be placed in the open, select a warm, open site, protected from winds, and having a well-drained base of ashes or gravel to stand the pots upon. Do not crowd them, but allow ample room for growth, and, for convenience in working amongst them, arrange them in beds, five or six plants wide, with broad alleys between the beds. Keep a sharp look out for insects ; in a hot, dry season, red spider will be sure to be troublesome, unless preventive measures are taken as recommended on page 87. In such weather, plants obtain much benefit from sprayings with tepid rain-water in the evenings. If, on the contrary, wet weather prevails, necessitating the use of artificial manure being sprinkled on the surface soil in place of liquid manure, see that the soil is lightly stirred, and not allowed to green over or become clogged. Remove the plants to the houses as early in August as possible, but be careful to inure them gradually to their changed quarters, and, as far as possible, continue the open-air conditions, namely, plenty of light and air, and a moist atmosphere about the plants.

PLANTS IN HOUSES

During the summer these must not be coddled in any way ; they require an abundance of air at most times, and in summer it will be necessary to have the doors open. The afternoon or evening is the best time to do the principal watering, although morning waterings will be also necessary on hot days. Rain-water is best at all times and for all purposes. If hard tap-water alone is available, take measures to soften it by exposing it to the sun in tanks. Morning and evening sprayings will be beneficial, and the pathways and other surfaces should be damped frequently during hot weather. On extremely hot days, shading by blinds or other means is necessary, as may be observed by the distressed and flagging appearance of unshaded vegetation on such days.

Stopping the Shoots.—This is a most important item, and it is done primarily to induce the formation of a greater number of shoots, and a bushy-habited plant. The first stopping should take place when the plants have reached a height of 6 inches, making sure that the point of the shoot is cleanly taken out close to a joint. It will be observed that some varieties of the Britannia type, after stopping, break freely and produce young shoots right down the stem. Other varieties of a less stocky growth, such as Enchantress, when stopped, only form three or four shoots at the top of the plant, leaving a bare stem below. These, if cut down to within 3 inches of the soil, break better from the base. Subsequent stoppings must take place as soon as the plants have grown to a suitable size—that is, about 4 to 6 inches—examining

the stock once a week for this purpose. The proper time to cease stopping depends upon the approximate date the plants are required to flower. Varieties differ in the time they take to come into flower after their final stopping. I will therefore append a list of varieties, with the dates of last stoppings, when the bulk of the flowers are wanted for the latter part of November and the months of December and January. Even then, this type of Carnation would not be perpetual-flowering if the time was not considerable between the opening of the first and last flowers. The later in the season the stopping of a plant is continued, the longer it will be in coming into flower. For instance, it is recommended to stop the variety Britannia for the last time at the end of August. This will result in this variety commencing to flower in November; but if the last stopping is delayed until a month later, it naturally follows the flowering period is delayed by more than a month, principally owing to the less favourable season for growth.

Disbudding.—Where flowers of the largest size and best quality are desired, it is necessary to pick off, at an early stage of their growth, all buds except the terminal one on each flower-stem. This practice is now adopted generally, but some varieties, such, for instance, as Robert Craig and Britannia, if allowed to bear three or four buds on a strong stem in various stages of development, make excellent decorative plants, and are preferred by some, to plants which are more rigidly thinned. The old variety Winter Cheer was, in its best day, a notable example of this particular form of cultivation.

Staking.—There are numerous devices and methods

employed for supporting the flower-stems, but having tried various forms of spiral wire, and wire supports, I think that for plants in pots there is nothing better and neater than strong bamboo tips, if these are dyed green or painted. For plants in pots up to 7 inches in diameter, one stake pointed and thrust into the soil, not too near the stem to injure it, is all that is necessary, and to these the shoots can be slung with thin, green raffia, tying them loosely. Staking may be done at any convenient time after the plants are potted into their flowering pots; but it is not really required until they begin to throw up their flower-stems, when it should be carried out promptly; otherwise, the flower-stems may become twisted and injured. Two-year-old plants in larger pots will need from three to five stakes each, which of necessity will have to be longer and stronger than bamboo tips. Strong, galvanised-wire, ring supports, having three upright wires for holding the rings which, when fixed in the soil, hold them rigid, do not require tying, the flower-stems being held loosely inside the wire rings. This latter method is adopted frequently for supporting the flower-stems of plants planted out on stages or benches, and if the three upright wires are made not less than 3 feet long, it is a simple matter to adjust the rings to suit the height of the flower-stems. The most general system of supporting bench-grown flower-stems is that of stretching wires or strings between the rows of plants, both lengthways and across the benches, fastening them to strong supports, and thus forming a mesh-work of wire or string, each mesh containing the flower-stems of one plant, no further tying being necessary. The supports should be

sufficiently high to admit of extra meshes being added as these are required.

USE OF MANURES

The application of natural and artificial manures is one requiring an intelligent observation of the requirements of the plants. Soils vary greatly in degree of fertility; but, no matter how rich in plant food a soil may be, the limited quantity a pot will contain, compared with the roots a healthy plant possesses, causes it to become exhausted. The Carnation being a gross-feeding plant, I look upon the careful use of stimulants as one of the principal items in its successful culture. In many instances, the food is not afforded until the plants are in a starving condition, and they are then unable to make good use of rich food suddenly applied. The cultivator should commence early with weak applications of soot and manure water, gradually increasing the amount as the plants grow stronger and older. Considerable care must be exercised in applying chemical manures, and some knowledge of their effects on plant growth is necessary, much harm being done by a too constant use of these manures, especially during the winter months. At one time I recommended that manures should be withheld during the winter and flowering periods; but as this kind of Carnation is perpetual in its flowering, so it is perpetual in its need of plant food, and, even during the winter months, weak stimulants given at least once a week are beneficial, and they do not affect the lasting qualities or colours of the flowers. Nitrogen is contained in varying quantities in all natural manures, such as pigeon, hen, deer,

sheep, pig, and cow manure, and in an artificial form it is obtainable in nitrate of soda, sulphate of ammonia, guano, etc. Phosphoric acid is contained in bones, superphosphate, etc., and potash in the form of sulphate of potash, kainit, and wood-ashes. These elements are contained in suitable proportions in all good Carnation manures sold by the nurserymen. Soot is also an excellent fertiliser, and should be applied in the form of soot-water, obtained by placing half a bushel of soot in a sack in a tub of water, and allowing it to soak, using the water in a clear state, and greatly diluted. In the same way the natural manures may be prepared and used in a diluted liquid form. To induce or hasten flowering, superphosphate sprinkled at the rate of a quarter of an ounce to each plant on benches, or dissolved in water for pot-plants, will have a good effect.

CHAPTER XIII

STAGE OR BENCH SYSTEM OF CULTIVATION

THIS method of cultivation originated in America, where it is practised more generally than any other system. Within the last few years it has been largely adopted by market-growers and others in this country. If great quantities of cut flowers are the first consideration, it is an excellent system, and the most simple way of producing them. I have seen several instances where ordinary span-roofed greenhouses have been converted into Carnation houses, and the central and side stages, with very little trouble, made into Carnation benches. Except in the case of very lofty or heavily-built houses, the plants succeed well, and produce a continuous supply of flowers over a long period. The sides of the benches consist of an 8-inch by 2-inch board, or thin slate slabs of a similar depth, screwed or fastened together at the corners, making a frame-work to contain the soil for the Carnations. It is important to see that the side benches are not too close to the roof, otherwise the flowering shoots will become injured by crowding against the glass. If it is not convenient to lower the side stages, this difficulty may, to a certain extent, be overcome by planting the two back rows with varieties of dwarf habit. See that the benches are well drained, by placing a 2-inch layer of crocks or cinders over the bottom, which should be perforated to allow the water to pass away freely. The

provision of compost similar to that recommended for pot plants, to the depth of 5 inches, completes the preparation of the benches. It is a matter of individual convenience whether the plants are planted out from pots in May, and attended to during the summer months in the house, or are planted in the early autumn, having been grown out-of-doors. If grown on the benches all the summer—and many growers are now practising this treatment—the house must be constantly ventilated, and the plants must be given copious supplies of water with frequent applications of liquid and artificial manures, the aim being to promote a free growth and large, stocky plants by the autumn. If the plants, on the contrary, have been planted out in the open, equal care and attention should be afforded them, and the greatest care taken in lifting and planting them in their winter quarters as early in August as possible. Lift them with a good ball of soil, and plant them firmly in the benches prepared for them. Should the weather be hot and dry, syringe them lightly three or four times a day, and shade them from sunshine until established. It is important to promote a strong healthy root action after planting, as a severe check to growth at this stage is most detrimental. With care in lifting and planting, the plants will soon recover from the check of removal and start into growth. In the same month (August), benches may be planted up with plants from 5 and 6 inch pots, care being taken to have the balls of soil well soaked with water previously; also the sides of same slightly pricked around, to disentangle the roots from the circular position in which they have been growing. Plant them at distances of one foot apart each way, taking care not to bury the stem deeper

in the soil than it was growing previously. If anything, raise it slightly higher, and stem-roots will then be less likely to occur. The subsequent cultivation is the same as for pot-grown plants, but greater care must be observed in watering during the winter months. Watering then is not often necessary more than once in ten days, or even a fortnight, when sufficient should be given in a tepid state to saturate the whole mass of soil. In early spring, when the roots become more active, more frequent waterings will be required, and at each time a stimulant should be given, varying liquid manure with a top-dressing of an approved artificial fertiliser. In America, the field cultivation of the plants for benches is practised universally, and great pains are taken to have the soil in a rich, workable condition at the time of planting in the open. In the previous autumn, the ground is manured liberally and dug or ploughed ; it is left in this condition until early in the spring, when it is again worked thoroughly previous to the planting. Planting takes place when all danger of frost is over, and the young plants, usually from 3-inch pots, are planted 15 to 18 inches apart between the rows, and 10 to 12 inches in the row. They receive constant attention in the way of stopping and watering until they are lifted in the months of July and August and planted in their winter quarters on benches under glass. This method is being practised in this country, with good results ; but the Carnations are not planted out until the beginning of May, when they are bushy plants in 4 or 5 inch pots, having been previously well hardened in cold frames.

CHAPTER XIV

PESTS AND DISEASES

Green-fly.—This is the most troublesome pest of the Carnation, but it need not prove destructive if preventive measures are employed at the proper time. When the plants are under glass, nothing is more effectual than vaporising with a good nicotine compound directly the first signs of fly are observed. Plants growing in the open should be sprayed with quassia extract, dipping in this liquid any plants badly affected, or having the aphides concealed in the points of the shoots where spraying cannot reach them.

Red Spider.—In hot, dry seasons, red spider is a troublesome little pest, usually attacking the under side of old and young foliage; its presence may be detected by the yellow appearance of the foliage, caused by the insects feeding upon it. Slight attacks may be remedied easily, by laying the plants on their sides and forcibly syringing them with clear water. An excellent remedy, and the best preventive, is to spray the plants with common salt diluted in water at the strength of one ounce of salt to two gallons of water, taking care that the spray reaches the under sides of the leaves. If this is done in the cool of the evening, once a week, and the plants syringed next day with clear water, it will have the effect of keeping them clean and healthy.

Thrips.—These little black insects do considerable damage to the tips of the flower-stems, young foliage, and

flower-buds, very often rendering the first opening flowers useless. Spraying with quassia extract is effectual for plants outside, while, for plants under glass, vaporising is most valuable, and the fumigation may be repeated a second or a third time, at intervals of three or four days.

Earwigs are in some seasons a nuisance, attacking and eating the young foliage; but they are most destructive to the flowers, concealing themselves at the base of the petals, upon which they feed. An excellent trap consists of a hollow bamboo, thrust in the soil beside the plant; the earwigs will secrete themselves in this at night, where they can be captured and killed by means of a wire pushed down the hollow of the bamboo. The old-fashioned flower-pot trap, filled with dry hay or moss, is a simple and good way of catching them. An occasional examination with a lantern at night, will reveal earwigs and other nocturnal visitors, including snails and weevils, when they may be destroyed.

Wireworm is more to be dreaded by the Carnation-grower than any other pest; it causes many Carnations to die amongst those planted out under glass and in the open. While some soils are quite free of the pest, others are badly infested with it, and these are highly dangerous soils to use at any price, unless thoroughly sterilised by roasting, as advised under "Potting." Although roasting is recommended for indoor plants, care must be taken that the soil is not allowed to burn. This may be prevented by continually stirring and turning it during the process of roasting. Land intended for Carnation planting, when worked in the autumn as previously advised, if wireworm is present in it, may have gas-lime sprinkled thickly upon it after digging; the winter rains washing the properties of the lime into the

ground, will kill wireworm and other larvæ. It must be remembered, however, that gas-lime applied in a fresh state is injurious to plant life.

DISEASES

Carnations in general are subject to diseases peculiar to their species, and they are usually rendered epidemic by unsuitable culture and management. It is strange that certain varieties of Carnations are more prone to disease than others. This being so, isolation in the first place (as a preventive of the spread of disease spores) of these plants is essential, and, in the case of badly affected plants, destruction by burning is profitable in the end, as they might otherwise contaminate others that are not in the least weakly.

Carnation Leaf-Spot (*Uromyces Dianthi*).—This disease, although not a deadly one, is the most prevalent, and its presence on the plants affected may at first be detected by the raised, warty-like appearance of the surface of the foliage and on the stems. This raised surface bursts, and the spores in the form of a fine, dark-brown, dust-like substance are scattered over the plants. Those badly infested soon become covered with infectious spores if preventive measures are not taken. Sulphide of potassium dissolved at the rate of one ounce to three gallons of water, and sprayed over the plants, is a good remedy, taking care to keep the liquid from touching white paint-work, which it soon discolours. Veltha Emulsion is also a good preparation for checking the spread of fungal diseases, but my experience is that where the trouble has become deep-rooted, no remedy is really effectual in eradicating it.

When the disease is first observed, cutting away the affected leaves, before the spores are ripe, is the best way of dealing with it.

Fairy-Ring (*Heterosporium echinulatum*) is, in many respects, similar to the Carnation-spot, but in this the fairy-ring-like spots extend and grow together, consuming the tissues of the leaves, and leaving them in parts dried and withered. I know of nothing better than pulling off, close to the stem, the affected leaves, and burning them, then employing the same fungicides in spray form as recommended for Rust. As a safeguard against these and other diseases, attend strictly to cultural details, and thereby build up a strong, healthy plant, which under good management will better withstand the attacks of disease and insect pests than poor and badly grown specimens.

CHAPTER XV

SELECTION OF VARIETIES OF PERPETUAL-FLOWERING CARNATIONS

I HAVE before me a long list of Perpetual-Flowering Carnations I grew only six years ago; but so rapid has been the improvement on the varieties grown at that time, that they have been discarded with two or three exceptions. At the same time, this is not all due to the improvement in recent introductions. Varieties of most flowers—and the Carnation is no exception—deteriorate in course of time, and such sorts as the once popular Duchess of Devonshire, Winter Cheer, and Madame Franco are now seldom to be seen. Yet these in their best days, although lacking in length of stem and size of flower, were admirable in every other respect, and true Perpetual-Flowering Carnations. I append a select list of varieties, with their colours, the letters attached being the key to the time of the last stopping of those varieties which I have cultivated. A little allowance should be made for the state of the weather at the time of stopping. If it is wet, stop early; if very dry, let the stopping be done at a later date.

LIST OF VARIETIES AND COLOURS OF PERPETUAL-FLOWERING CARNATIONS, WITH APPROXIMATE DATES OF FINAL STOPPING

White

B. Lady Bountiful.
B. Leith Peary.
B. Sarah Hill.
B. White Enchantress.
C. White Lawson.
C. White Perfection. (Pl. VIII.)

Scarlet

Andrew Carnegie.
B. Beacon.
B. Britannia.
C. Cardinal.
B. Defiance.
B. O. P. Bassett.
C. Red Lawson.
B. Robert Craig.
C. Victory.

Crimson

Carola. (Pl. VII.)
B. Daheim.
C. Harlowarden.
A. Harry Fenn.
Harvard.
A. The President.

Pink

C. Aristocrat.
B. Candace.
B. Enchantress.
C. Fair Maid.
B. Mrs. H. Burnett.
C. Mrs. T. W. Lawson.
C. Winsor. (Pl. VI.)
Winona.

Rich Rose

B. Afterglow.
B. Nelson Fisher.
B. Rose Dore.
B. The Honourable A. Fellowes.
B. Pink Enchantress.

Fancy Varieties

B. *Jessica*, white ground, with scarlet stripes.
B. *Mrs. M. A. Patten*, white ground, with scarlet stripes.
B. *Mikado*, heliotrope.
A. *Prosperity*, white and pink blotched.
Royal Purple, purple.

Time of Stopping

A. End of July.
B. Middle to end of August.
C. Early September.

CHAPTER XVI

ROCK-GARDEN PINKS

By JAMES DOUGLAS, V.M.H.

It is well known to botanists and to many cultivators of hardy flowers that there are other species of Dianthus besides *D. barbatus*, the Sweet William, *D. plumarius*, the Garden Pink, and *D. Caryophyllus*, the Clove Pink, or Carnation. Indeed, the number exceeds two hundred, but not many of the species are found in gardens. Some do not possess any merit as garden flowers, although they are interesting to botanists; others, on the contrary, are very beautiful, and form most interesting objects in the rock garden.

My own garden consists of a medium loam, 18 inches to 30 inches over chalk, and the species of Dianthus revel in this soil, which has been improved by the application of a good dressing of decayed manure. Most of the species produce seed, and, if the seed is sown in spring, the seedlings pricked out and cultivated carefully, they form large plants that flower freely in the second year. Although Dianthuses are well adapted for the rock garden, they may be planted in any hardy-flower border, in a position exposed to the light, and where the Pinks will not be overborne by herbaceous plants. Some of them are of low growth, producing small leaves, which form very pretty tufts even when the plants are not in flower.

Dianthus alpinus.—This species belongs to the low-growing type, and it is one of the prettiest of them. The flowers are large for the size of the plant; they are rose-coloured, with blotches or spots of deep red. The petals are notched, as are those of most of the species.

D. arbusculus (*Shrubby Chinese Pink*).—I have not seen this in flower, but it is described in Nicholson's *Dictionary of Gardening*, and it is figured in the *Botanical Register*, Plate 1086. It is stated to be half-hardy only, and was introduced from China for the Royal Horticultural Society, in 1824, by D. Perks. It is said to flower freely from July to October. The flowers are semi-double and large, of a delicate, rich-purplish colour; they are produced in terminal panicles.

D. arenarius (*the Sand Pink*).—This species is figured in the *Botanical Magazine*, Tab. 2038, and seems to have been in cultivation for a long time. It has been described as having purple flowers, but the variety illustrated in the *Bot. Mag.* is white, with a faint greenish spot in the centre, and covered with short, dark-purple hairs. The petals are deeply divided into narrow lobes.

D. carthusianorum (*Carthusian Pink*).—This is a very distinct and pretty species. It grows freely on any chalky soil. The flowers are collected into a close head, twelve or more together, on stems a foot to eighteen inches high. It does not grow in all gardens so freely as some species. It is figured in the *Bot. Mag.*, Tab. 2039. Except in the pink colour of the flowers, it does not differ materially from *D. atrorubens*, or *D. capitatus*.

D. carneus.—This species forms a neat plant, and flowers in any rock garden on the chalk in summer.

PLATE VII

CAROLA

(Perpetual-Flowering variety)

D. chinensis (*Chinese or Indian Pink*).—This species is really a biennial, and the numerous varieties now in cultivation are very handsome. It is figured in the *Bot. Mag.*, Tab. 25, and is there stated to be "little better than an annual." As a contrast to this plate, several varieties with laciniated petals are figured in the same periodical, Tab. 5536.

D. deltoides (*Maiden Pink*).—This is one of the most charming species, the flowers being deep pink, with a darker centre. There is also a white form which I have raised from seed. It has pink spots in the centre, and is very pretty for mixing with the rose and pink coloured forms.

D. fragrans (*Sweet-scented Pink*).—This should be grown as a true rock plant. The solitary flowers are white and well rounded, the petals overlapping. Nicholson says it is white, suffused with purple. It is figured and described in the *Bot. Mag.*, Tab. 2067.

D. Holtzeri (*Holtzer's*).—This species grows very freely in the rock garden. The pink-coloured flowers are not large, but they are prettily fringed.

D. glacialis (*Icy*).—This is a true alpine species, producing its small, almost scentless, purple flowers on stems about 3 or 4 inches high.

D. Libanotis (*the Pink of Lebanon*).—This is a very remarkable species, and seems to have been discovered on the highest points of Mount Lebanon by the French botanist, Labillardière. The curious, white flowers, with deep red spots at the base of the petals, are borne on stems 4 feet high. It first bloomed with a Mr. Lambert, who sent flowers to Dr. Lindley, and these were figured in the *Botanical Register*, Plate 1548.

D. cæsius (*Cheddar Pink*).—A typical English species, which grows only 3 or 4 inches in height. The flowers are variously rose-coloured. It may be established in gardens, either as a plant on walls, or in the rock garden. It does admirably on our chalky soil; in soils that do not contain lime, some mortar rubble should be added. Its bluish-grey foliage is very pretty, even when the plant is not in flower.

D. Caryophyllus (*Clove Pink*).—This is the parent type of the garden Carnations and Picotees; but as a garden plant the type species is very rare, unless the numerous single-flowered forms of the Carnation produced from every packet of seed of the double-flowered varieties may be taken to represent the type. The species used to grow on the walls of Rochester Castle, but it is supposed to be a naturalised plant in Britain, and not indigenous. The flowers are rose and pink coloured of various tints.

D. caucaseus (*Caucasean Pink*).—The first cultivated plants of this species were raised from seed which Messrs. Loddiges procured from Mount Caucasus. It is figured in the *Bot. Mag.*, Tab. 795, and later, at Tab. 5215, *D. seguieri* is figured as a variety of *D. caucaseus*, which it probably is. *D. ruthenicus*, *D. collinus*, and *D. montanus* are all varieties, or synonyms, of *D. caucaseus*.

D. petreus (*Rock Pink*).—A pretty species with white flowers, borne on erect but slender stems. This species does not differ very materially from *D. plumarius*, except that the petals are not so finely divided.

D. plumarius (*Garden Pink*).—This is the original type of the numerous varieties of the Garden Pink. The wild form is a very poor thing, and not worth cultivation.

But the numerous varieties, both double and single, are the sweetest and most charming of hardy garden plants. The flowers of the type form are white, and the plant is easily raised from seed or cuttings (see p. 45).

D. rupestris (syn., *D. virgineus*).—The Virgin Pink. This is figured in the *Bot. Mag.*, Tab. 1740, from specimens sent by Messrs. Loddiges of Hackney, in 1814. It is a pretty species, with pink flowers borne on stems about 2 feet high.

D. superbus.—A very desirable species. It is well known and widely distributed in Germany, Switzerland, France, and Denmark. It is mentioned by Clusius in 1601, who found it growing in moist meadows about Vienna, some with white, others with purplish flowers. All the old authors agree as to its delightful perfume. Parkinson writes of it as "of a moſt fragrant ſent, comforting the ſpirits and ſenſes afarre off." The petals are divided very finely. Seeds are produced freely. (*Bot. Mag.*, Tab. 297.)

D. superbus Gardneri (*Gardner's*).—A variety of *D. superbus*, with very large flowers of a better form.

The species already mentioned are the best of those in cultivation. It may be added that in the *Index Kewensis* there is a list of more than three hundred species of Dianthus.

CHAPTER XVII

CALENDAR OF OPERATIONS

JANUARY

Border Carnations and Picotees.—Examine plants in the open garden after severe frosts, and press in firmly the roots of any that have become loosened. Seedlings should always be well established before the winter. If the garden is exposed to rabbits and hares, put wire netting a yard wide round the beds. The plants, potted up and placed in garden frames, should have the lights removed entirely in fine weather, but they need protection from rain and cold winds. They require very little water, and this should be applied in the morning, when there is no danger from frosts. Remove all dead and decaying leaves, and if there are any traces of green-fly, fumigate the frames with a nicotine vaporiser.

Malmaison Varieties.—If the flowers are required as early as possible in spring, let the plants have a temperature of 50° at night. Two-year-old plants are invaluable for the production of the earliest blooms. A rather dry atmosphere is best for them at this season, and the roots should be kept on the dry side ; fumigate at once if green-fly appears, as this pest not only cripples the plants, but exudes a sticky substance which is very injurious to them. If a fungus disease appears, remove all diseased leaves and burn them. The later flowering plants may be kept in

a cool greenhouse, where they will need very little water. Avoid wetting the leaves.

Perpetual-Flowering Varieties.—These ought now to be flowering freely. They do best if placed in a house by themselves, and this month a minimum temperature of 50° to 55° is sufficient, the latter in mild weather. Admit plenty of fresh air, and keep the atmosphere rather dry. Give careful attention to watering, and keep the plants clean by fumigating. Cuttings should be taken this month and inserted in sand over bottom heat in the propagating frame. Pot on the cuttings rooted in October from 2-inch and 3-inch, into 4-inch and 5-inch pots. These make excellent plants for planting out in May, to flower in beds in the open. For the present they may be placed in a house where the temperature at night is 55° to 60°, and by day 60° to 65°.

Pinks.—These, being in the open air, require similar treatment to the border Carnations and Picotees. The few plants potted up to fill gaps require the same treatment as the Carnations in frames.

FEBRUARY

Border Carnations and Picotees.—If the weather is mild, the plants will show signs of growth ; but this is not desirable, as sharp frosts may succeed the mild weather. Remove the lights from the frames whenever the weather permits. Get the pots and the compost ready for repotting such plants as are to be grown in pots. Those plants which have been longest in the small flower-pots should be repotted towards the end of the month. See that the compost is free from wireworms.

Malmaison Varieties.—The plants may now have a night temperature of 50°. Expose them to all the light

possible, and admit air freely. In other respects the treatment should be similar to that afforded in January.

Perpetual-Flowering Varieties.—Continue to take slips or cuttings, and treat them as advised for January. Let the flowering plants be looked over, removing all dead or decaying flowers and leaves. The plants in bud should have the growths tied to neat sticks, painted green, of a tint as near as possible to that of the leaves; a dull green is not so obtrusive as a bright green. Pot on the plants as they require it and inure them very gradually to a lower temperature. They should not be repotted from the warm house, and placed at once in a cold one; it is better to return them to the warm house until they have made new roots. The temperatures should be the same as in January. Cut back slightly a number of year-old plants for growing on a second year, keeping them on the dry side until they commence to grow.

MARCH

Border Carnations and Picotees.—Assuming that the flower-pots are ready, and the compost prepared, repotting may be proceeded with in favourable weather. See that the plants are quite free from green-fly before repotting them. Potting soil of the best quality is not easy to be obtained in some districts, but if the fibrous part of decayed turf is available, some of it may be placed over the ample drainage to prevent the finer particles of the compost from mixing with it. In fine weather, look over the beds of Carnations, and stir the surface soil, removing weeds; fill up any blanks by utilising the reserve plants now in frames. Plant firmly, inserting each plant into the ground to the first pair of leaves. If the weather

is unfavourable, the repotted plants should be kept in the frames for a time.

Malmaison Varieties.—Such plants as may have developed their flower-buds should have all of them removed except the crown bud on each stem. A night temperature of 55° is still sufficient. Plants at present in a cool house for late flowering will also be showing their flower-stems, and if they are not already repotted, no time ought now to be lost. They must have filled the small (3½-inch) flower-pots in which they were wintered, therefore, they may be repotted into 32's (6-inch), and in these they will produce their flowers.

Perpetual-Flowering Varieties.—Continue to put in cuttings if more are necessary. Those that are rooted must be potted on as soon as they are ready, one plant in a small 60 (2½-inch) flower-pot. Plants in flower or bud need a temperature of 50° to 55° at night, and as free a circulation of air as possible. Attend to disbudding. Give frequent supplies of liquid manure to old plants, both in pots and benches. Pinch out the points of young plants when they are about 6 inches high.

Pinks.—Those now in the open garden should have the surface soil stirred, and the weeds removed. If any plants have died during winter, replace them as advised for Carnations. Seeds of all Carnations and Pinks should be sown this month, in seed-pans filled with fine soil; these should be placed in a warm house for the seeds to germinate.

APRIL

Border Carnations and Picotees.—Repotting should be finished before the end of April, by which time the plants

may all be placed out-of-doors. The Flakes, Bizarres, and Picotees ought all to be kept in their proper order, and it is well that they should also be arranged alphabetically. From time immemorial, the Bizarres have been placed in the following order: Scarlet, Crimson, Pink, Purple. Flakes begin with Purple, followed by Scarlet and Rose. Picotees are arranged thus: Red, heavy and light edged; Purple, heavy and light; Rose and Scarlet, heavy and light edged. If they are also arranged in the order of the alphabet, any variety can be found at once as easily as names in a dictionary. As two plants are placed in an 8-inch flower-pot, and three in a 9-inch, there is, at the first, a considerable body of soil and no active roots in it, therefore no water is needed until some days after repotting. Few of the plants will require any sticks, but any that are weakly should be supported to save them from injury by wind. The seedlings should be pricked out 3 inches apart into seed-boxes or frames. In a warm house the seedlings appear above ground in a week or so, and it is best to prick them out as soon as the seed-leaves are fully developed.

Malmaison Varieties.—Amateurs sometimes inquire if this class of Carnations may be planted in the borders out-of-doors. They may be planted, but only some of the hybrid Malmaisons will succeed. The variety Prime Minister does well; it is a bright scarlet flower. Other varieties that may be planted out are Horace Hutchinson, Scarlet Iolanthe, bright rose, Lady rose, Lady Ulrica, salmon-rose, Mercia, salmon, and Nautilus, delicate pink. These may be planted out in a rather sheltered position at about the end of the month. Those flowering under glass must be kept free from green-fly and thrips by fumigations carried out before the flowers open; the smell of tobacco

is not agreeable on the expanded blossoms. For ordinary purposes not many varieties are required. The old blush and pink forms are still indispensable, the white Nell Gwynne, the blush changing to white, Thora, Nautilus, Prime Minister, Lady Grimston, Maggie Hodgson, crimson, and Duchess of Westminster, pink.

Perpetual-Flowering Varieties.—The temperature should be 55° at night. Repot the young plants as they require it, and gradually inure them to a cooler atmosphere. Pot on, into 8-inch and 9-inch pots, plants which were cut back in February for growing a second year. Shade newly potted plants from bright sunshine, and spray them with clear water each morning and afternoon. Never pot and pinch a plant at the same time.

MAY

Border Carnations and Picotees.—This is a busy month, especially for those who are growing the flowers for exhibition. It may be necessary to surface-dress the soil in the flower-pots, to throw more vigour into the Bizarres, Flakes, and Picotees. One of the oldest varieties, Admiral Curzon, won the prize for the Premier bloom in 1909 at the exhibition of the National Carnation Society. It is only by very careful cultivation that such old varieties can be kept in vigour, and a surface dressing of equal parts loam and decayed manure about the second week in May is very helpful. The permanent sticks may now be placed to the plants, and they may be tied with raffia, or neat wire fastenings may be used; these can be obtained from any dealer in Carnations. In mild weather the plants must be syringed daily to keep off green-fly and thrips.

Malmaison Varieties.—A succession of these may be

well kept up, until the border varieties are in flower in July. Plants which have filled their flower-pots well with roots may be helped by waterings of weak manure water, three times in a week. Those not in flower may be syringed freely in warm weather to keep off red spider. Look out also for fungus disease, which can best be destroyed by cutting off all diseased leaves as soon as the disease is observed. Ventilate the house freely.

Perpetual-Flowering-Varieties.—The plants propagated from slips and cuttings must have careful attention, and be shifted into larger flower-pots as they require it. Plants which were propagated in December will now be ready for potting into their flowering pots. They should be afforded a porous, rich compost, and this should be made very firm. Those intended for planting out in benches in autumn should be hardened gradually, afterwards planting them in well-prepared soil in the open. Those intended for flowering in beds in the flower garden should be hardened similarly, and may be planted at the end of the month.

Pinks.—Stir the surface of the beds, after the sticks have been placed to the rising flower-stems. It is beneficial to give the beds a slight dressing of decayed manure.

JUNE

Border Carnations and Picotees.—Continue to tie the flower-stems to the sticks; these latter should stand 2 feet 6 inches to 3 feet out of the soil. Attend to disbudding as soon as the buds are large enough; it is usual to allow three buds to one flower-stem. Some, who wish for very large blooms for exhibition, will remove all but the leading bud. Others do not disbud at all, allowing all the flowers to develop. The plants may be syringed frequently during

PLATE VIII

WHITE PERFECTION

(Perpetual-Flowering variety)

this month. If a surface dressing was not applied last month, it ought to be given in June. All the plants in beds may be given a surface dressing of decayed stable manure, after the Dutch hoe has been used between the rows. If dry weather sets in, waterings will be needed.

Malmaison Varieties.—These should now afford abundance of blooms, if thrips and green-fly have been kept from the leaves. Ventilate freely, and damp the staging twice a day in hot, dry weather. Provide shade as soon as the flowers are opening freely. Remove dead and decaying leaves, and any affected with disease.

Perpetual-Flowering Varieties.—The work will now include repotting the plants, placing sticks to such as need support, and stopping the growths to form bushy plants. Seedling Carnations raised in January, or the first week in February, should now be planted out-of-doors where they are to flower. If they are planted in good soil at 2 feet apart between the rows, and 18 inches apart in the rows, they will flower freely in September and October. As regards those growing in pots for flowering in late autumn and winter, frequent repotting is better than placing the plants now in small pots into their flowering pots at once. Repot from small 60's into the large 60's, and from these into 5 and 6 inch flower-pots.

JULY

Border Carnations and Picotees.—All the show and border varieties will commence to flower this month, from the 20th, or a little earlier, until the middle of August, according to the season. The plants ought all to be put under glass promptly, and it is well to fumigate them to destroy thrips. Disbudding should be done, and the roots

and drainage examined as the plants are moved into the house. Commence layering about the end of the month.

Malmaison Varieties.—These will have finished flowering by the middle of the month. All layering should be done promptly. The earliest flowering plants may have been layered in June.

Perpetual-Flowering Varieties.—The object being to produce flowers from September to March, this is best done by having a succession of plants, and repotting them at various times. The time of stopping, too, influences to a great extent the time of flowering. Most varieties ought not to be stopped after the end of July. Plants produced from cuttings in the previous winter season will give good flowers in 6-inch pots; two-year-old plants, in 8-inch or 9-inch pots.

AUGUST

Border Carnations and Picotees.—Get the layering finished by the end of the month. Remove the fading flowers, unless it is intended to save the seed, when the petals only must be removed as they decay. Plants shaded in the greenhouse should be removed out-of-doors, as the best layers are those freely exposed to sunshine. Do not crowd the layers too closely together. As a rule, the best layers are obtained from plants flowered in the borders.

Malmaison Varieties.—Some of the layers may have been potted up last month; at any rate, some of them will be quite ready now, and they ought to be strong enough to allow each one to be planted in a 3-inch pot. Place them near the roof glass of a pit or greenhouse. Any old plants intended to flower as two-year-

old plants should have some of the soil removed from the roots, and be repotted.

Perpetual-Flowering Varieties.—The work is very much the same as last month. Green-fly and thrips are easily killed by fumigating. Red spider will surely appear in hot weather, and it is doubtful if any fumigating will kill them; the pest must be dislodged by the syringe or garden engine. Prepare for housing the pot plants and planting up the benches. The sooner the bench plants are placed in their positions the better. See that the houses and benches are made thoroughly sweet and clean before the plants are removed indoors. Give pot plants frequent applications of liquid manure, and top-dressings of an approved chemical fertiliser.

Pinks.—These are easily propagated by layers and slips. The young plants ought to be rooted by the beginning of this month, and the seed-pods, if seed is to be saved, will be ripening. As soon as the points of the seed-pods become brown, they may be gathered; the husk should be removed, and the pods laid out to dry. In ten days or more the seed may be removed, and put into packets until it is wanted in spring.

SEPTEMBER

Border Carnations and Picotees.—Remove the layers from the plants this month; as they were not layered all at the same time, those which were layered first should be the first to be repotted. The collections should be kept in alphabetical order, the Bizarres and Flakes to be arranged as previously advised. The number of layers potted or planted out of each variety should be kept entered in a book. New varieties intended to be added to the collection should be

ordered this month. The layers intended for the borders should not be planted until October, or even as late as the second week in November. As the layers are potted, they may be put at once into a garden frame.

Malmaison Varieties.—Complete the repotting of layers, and place them in a greenhouse rather than a frame. The rust fungus is apt to put in an appearance this month. Pick off all the leaves that are attacked.

Perpetual-Flowering Varieties.—Get the last of these removed into the houses if they are out-of-doors, as the leaves are apt to contract "spot." As soon as cold, damp weather sets in, allow a little heat in the water pipes, keeping a dry atmosphere and admitting a little air, both from the top and side ventilators. The flowers will not develop freely in dull, cold weather without a little heat. The plants being now in the houses, vaporise them with the X.L. All Vaporising Compound. Try and get the plants perfectly free from thrips and red spider.

Pinks.—These may be planted out in their flowering beds this month. Apply a surface dressing of rich soil to the older plants.

OCTOBER

Border Carnations and Picotees.—All the layers should be potted up this month. Any varieties which have not rooted well may be potted and plunged to the rims of the flower-pots in a very slight hotbed. The lights of the frame may be kept rather close, until new roots are formed; then remove the plants to a cold frame, where air must be admitted freely night and day.

Malmaison Varieties.—Keep the earliest flowering batch

in a moderately warm atmosphere, in order to obtain flowers as early as possible. The earliest layers should be repotted into the flowering pots as they require it.

Perpetual-Flowering Varieties.—As this note is being written, a letter has arrived complaining that the Perpetual-Flowering Carnation blooms are opening badly and are of small size (the letter is written in December). The reason why the flowers do not open satisfactorily is owing to a low temperature and moist atmosphere. Amateurs see the fine flowers exhibited in London and elsewhere, but the best of these are not only produced in a house specially set apart for them, and therefore properly heated and ventilated, but some are brought from places such as Guernsey, where the climate is favourable to their perfect development. As the flower-stems grow, attend early to supporting them with stakes. Do not coddle the plants in any way, but give them an abundance of air on all favourable occasions.

NOVEMBER

"November sky is chill and drear,
November's leaf is red and sear."

Border Carnations and Picotees.—Very little can be done after the layers are potted up or planted out, except to see that they are safe from insect pests.

Malmaison Varieties.—The plants should have full exposure to the light, and as much ventilation as may be consistent with the weather out-of-doors. The plants intended to flower early may be given similar treatment to the tree Carnations, and those intended for flowering later should be wintered with the border Carnations, if these are in a

house from which frost is excluded. The new varieties of Malmaisons may be wintered in frames.

Perpetual-Flowering Varieties.—The result of the season's work will now be apparent in a succession of choice flowers all through the winter and spring months. They will not, however, give good results either in a greenhouse temperature or the moist atmosphere of a hot-house. The temperature all through the winter may be 50° to 55°, as a minimum, with a rather dry atmosphere, and ventilation should be given on the windward side, even in severe weather. Keep the roof glass clean, so that it may admit all the light possible. Exercise great care in watering.

DECEMBER

Border Carnations and Picotees.—If the plants are well established in their small flower-pots, they will not suffer from the effects of frost, and the frame lights may be opened daily; but see that the plants are not exposed to rain, snow, or hail. Look over the plants once in the month to remove any decayed leaves and, if there is a "drip" from the glass lights, this should be remedied.

Malmaison Varieties.—Keep the glass of the house or frame as clean as possible, and all the wood-work inside. Fumigate the plants as often as is necessary.

Perpetual-Flowering Varieties.—The treatment is the same as last month. Good cuttings or slips may be obtained now, and these should be taken off, and treated as previously advised.

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